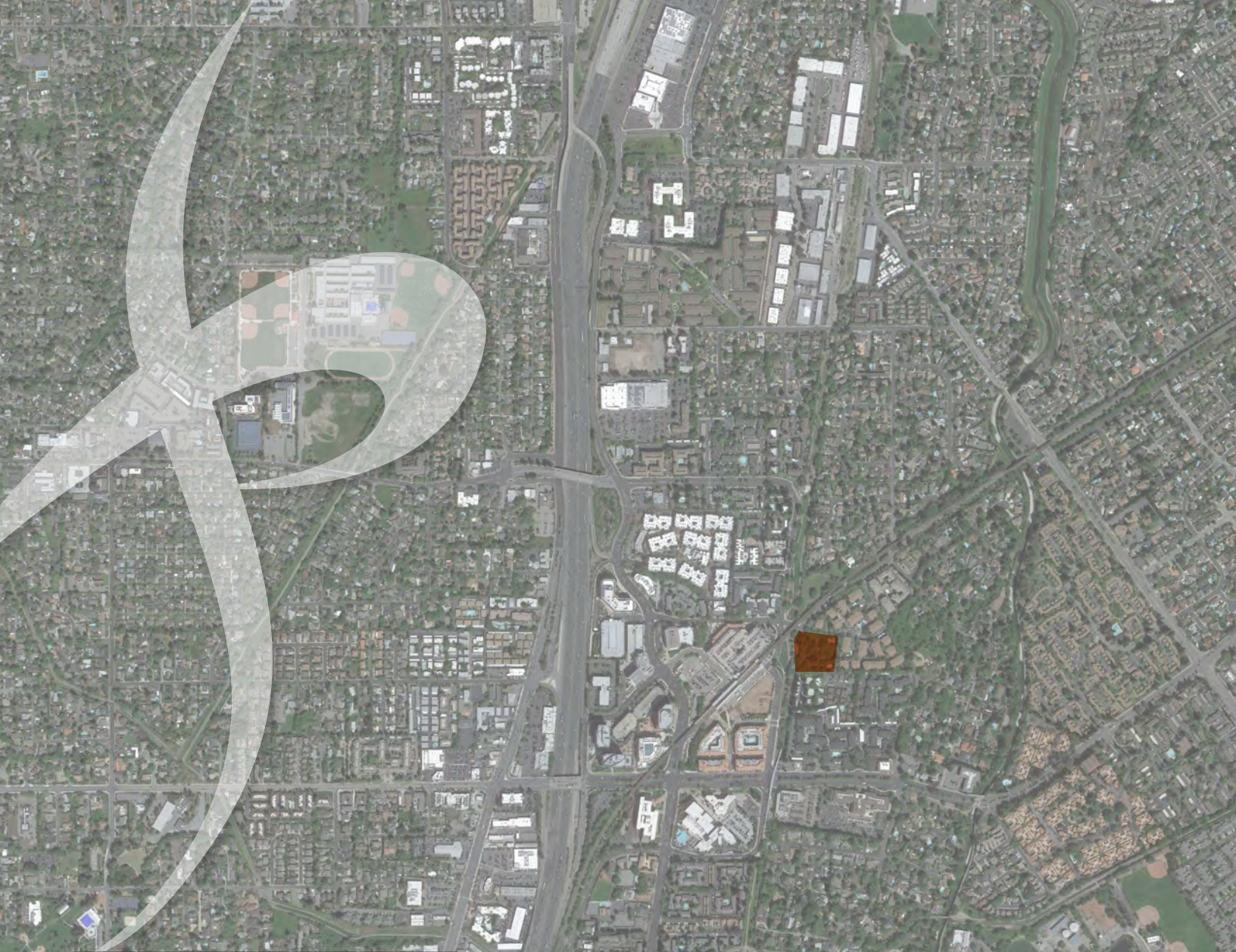


Appendix I: Transportation Supporting Information

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May 2019

Draft Final
Transportation Impact Assessment

Del Hombre Apartments

Prepared for:
Contra Costa County
First Carbon Solutions

Del Hombre Apartments

Transportation Impact Assessment

Prepared for:
Contra Costa County
First Carbon Solutions

August 2019

WC18-3552

FEHR  PEERS

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Executive Summary

This study presents the analysis and findings of the Transportation Impact Assessment (TIA) prepared for Del Hombre Apartments (project) in Contra Costa County, California.

Project Description and Analysis Parameters

The approximately 2.4-acre program area is located in Contra Costa County and it is bound by Del Hombre Lane to the west, Roble Road (private road) to the north, Honey Trail (private road) to the south, and residential development to the east. The site is an unincorporated area of Contra Costa County, adjacent to the City of Walnut Creek, and next to the Pleasant Hill BART/Contra Costa Center Bart Transit Village. The proposed project consists in a six-level, 284-unit apartment building and an 138,000 square foot parking garage with 380 parking spaces.

Project effects on the study area roadway facilities were determined by measuring the effect project traffic would have on intersections in the vicinity of the site for typical weekday conditions. Conditions were evaluated under Existing, Near-term and Cumulative conditions, both without and with the Project. A detailed site plan review and a parking assessment was also conducted. A vehicle miles of travel assessment was also conducted.

Off-Site Findings

Significant impacts to intersections were identified with construction of the project in the near-term and cumulative scenarios; one off-site impact would remain significant and unavoidable based on vehicle delay as measures to improve operations for vehicles degrade the pedestrian and bicycle environment, conflicting with General Plan policies related to bicycle and pedestrian travel. The project would also generate significant less vehicle miles of travel than the area average, reducing overall vehicle miles of travel on a per capita basis.

On-Site Findings

Based on a detailed site plan review, recommendations were made to enhance access and circulation for all modes, as detailed in Chapter 7.

1. Introduction

This report presents the analysis results and findings of the Transportation Impact Assessment (TIA) prepared for Del Hombre Apartments (project). This chapter discusses the analysis methods, criteria used to identify significant impacts, and report organization.

TIA Purpose

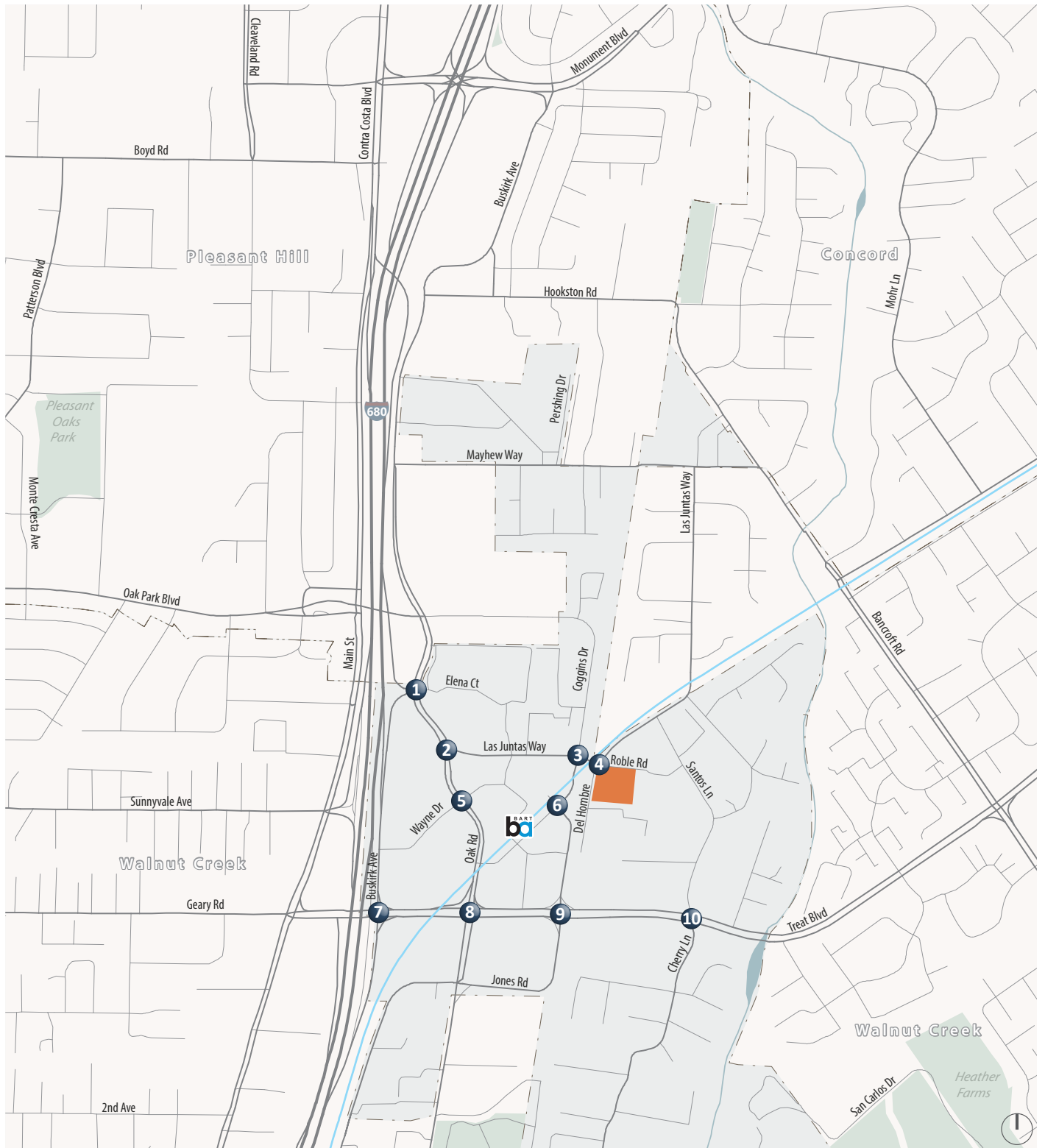
The TIA's purpose is to evaluate the transportation impacts of the development of the Del Hombre Apartment complex. The approximately 2.4-acre project site is located in Contra Costa County and it is bound by Del Hombre Lane to the west, Roble Road (private road) to the north, Honey Trail (private road) to the south, and residential development to the east, as shown on **Figure 1**. The site is located in an unincorporated area of Contra Costa County, adjacent to the City of Walnut Creek, and next to the Pleasant Hill BART/Contra Costa Center Bart Transit Village. The proposed project consists of a six-level, 284-unit apartment building and an 138,000 square foot parking garage with 380 parking spaces. A conceptual project site plan is illustrated on **Figure 2**.

This study addresses the project's impacts on the roadway system under existing, near-term and cumulative scenarios and discusses potential impacts to the adjacent bicycle, pedestrian, and transit network.

Report Organization

This report is divided into eight chapters as described below:

- **Chapter 1 – Introduction** discusses the purpose and organization of this report.
- **Chapter 2 – Existing Conditions** describes the transportation system in the project vicinity, including the surrounding roadway network, peak period intersection turning movement volumes, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- **Chapter 3 – Project Characteristics** presents the project description, and trip generation, distribution, and assignment.
- **Chapter 4 – Existing with Project Traffic Conditions** addresses the existing condition with the project and discusses vehicular impacts.



Project Site
 Study Intersection



Figure 1

Project Site Vicinity and Study Intersection Locations



Source (Elevation): BDE Architects, 11/1/18

Conceptual Project Site Plan



- **Chapter 5 – Existing with Approved Projects Traffic Conditions** addresses the near-term condition considering existing conditions combined with other approved projects in the area, both without and with the project and discusses vehicular impacts.
- **Chapter 6 – Cumulative Traffic Conditions** addresses future conditions, both without and with the project, and discusses vehicular impacts.
- **Chapter 7 – Site Access, Circulation and Parking** discusses site access, circulation and parking based on the current site plan for all modes of travel. Recommendations are provided.
- **Chapter 8 – Vehicle Miles of Travel** presents the results of the VMT assessment conducted for informational purposes only.

Study Locations, Analysis Scenarios and Analysis Methods

Project impacts to the study area roadway facilities were identified by measuring the effect of project traffic during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods to coincide with the time-periods when adjacent street traffic demands are greatest and when the project generates the most traffic. The study intersections were selected in consultation with Contra Cost County Staff, consistent with guidelines from CCTA Technical Procedures Manual, and based on a review of the project location, and the amount of traffic that could be added to the intersections in the site vicinity. The study intersections are listed below and shown previously on Figure 1.

1. Oak Road at Northbound I-680 On-Ramp/Buskirk Avenue
2. Oak Road at Las Juntas Way
3. Coggins Drive at Las Juntas Way
4. Del Hombre Lane at Roble Road
5. Oak Road at Wayne Drive
6. Coggins Drive at Jones Road
7. Treat Boulevard at Buskirk Avenue
8. Treat Boulevard at Oak Road
9. Treat Boulevard at Jones Road
10. Treat Boulevard at Cherry Lane

The operations of roadway facilities are described with the term “level of service” (LOS). LOS is a qualitative description of traffic flow from a vehicle driver’s perspective based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (free-flow conditions)



to LOS F (over capacity conditions). LOS E corresponds to operations “at capacity.” When volumes exceed capacity, stop-and-go conditions result, and operations are designated LOS F.

Different methods are used to assess signalized and unsignalized (stop-controlled) intersections.

Signalized Intersections

Operations of signalized intersections were evaluated using the method from the 6th Edition of the Transportation Research Board’s Highway Capacity Manual (HCM, 6th Edition), which uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue.

Table 1 summarizes the relationship between average delay per vehicle and LOS for signalized intersections. This method evaluates each intersection in isolation and the effects of vehicle queue spillback are not considered in the analysis results.

Unsignalized Intersections

Operations at unsignalized intersections were evaluated using the method from the HCM, 6th Edition. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. For side-street stop-controlled intersection, delays for the entire intersection and for the movement or approach with the highest delay are reported.

Table 2 summarizes the relationship between delay and LOS for unsignalized intersections.

Table 1: Signalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	< 10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	> 20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity (V/C) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	> 80.0

Source: *Highway Capacity Manual*, 6th Edition.

Table 2: Unsignalized Intersection LOS Criteria

Level of Service	Description	Delay in Seconds
A	Little or no delays	< 10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: *Highway Capacity Manual*, 6th Edition.

Vehicle Miles of Travel

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with final guidelines published in November 2017 incorporating public comments from the August 2014 and January 2016 guidelines. In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package along with an updated Technical Advisory related to Evaluating Transportation Impacts in CEQA (December 2018). Full compliance with the guidelines is expected by July 1, 2020.

The updated guidelines eliminate the use of automobile delay metrics, such as level of service, from determining significant environmental impacts from vehicle travel. Vehicle miles of travel (VMT) has been identified as the most appropriate metric to evaluate a project's transportation impacts, as projects that result in lower than average vehicle miles of travel support goals of reducing greenhouse gas emissions, while projects that result in higher than average levels of vehicle travel contribute to an increasing rate of greenhouse gas emissions.

Projects that are within a half-mile of an existing major transit stop, which is defined as a rail transit station, ferry terminal served by bus or rail transit, or at the intersection of two or more major bus routes with service frequencies of 15-minutes or less during the morning and afternoon peak commute periods, are presumed to be less-than-significant if the project has the following characteristics:

- Has a Floor Area Ratio (FAR) greater than 0.75
- Does not include more parking for use by residents, customers, or employees of the project than required by the jurisdiction (if the jurisdiction requires the project to supply parking)
- Is consistent with the applicable Sustainable Communities Strategy (as determined by the lead agency, with input from the Metropolitan Planning Organization)
- Does not replace affordable residential units with a smaller number of moderate or high-income residential units

If a project meets the screening requirements, it is presumed to have a less-than-significant impact related to vehicle miles of travel.

Regulatory Setting

The determination of significance for project impacts is based on applicable policies, regulations, goals, and guidelines defined by the Contra Costa County and adjacent communities. Changes to the CEQA guidelines as dictated by Senate Bill 743 are also considered.



The impacts of the project were evaluated by comparing the results of the technical analysis under Plus Project conditions to the results under Existing, Near-term and Cumulative without Project conditions. The following criteria were used to identify significant off-site impacts of the proposed project under the various criteria.

Roadway Network

For this study, based on guidance contained in the Contra Costa County General Plan and the CCTA Central County Action Plan, a significant transportation-related impact could occur if a project results in:

- Deterioration of a signalized intersection not on a route of regional significance from LOS D (or better) to LOS E or LOS F
- At an intersection not on a route of regional significance projected to operate at LOS E or F prior to the addition of project traffic, the project increases delay by more than 5-seconds¹
- Deterioration of peak hour operations of an all-way stop-controlled intersection from LOS D or better to LOS E or F, or at intersections where the LOS is E or F, one of the following:
 1. Project traffic results in satisfaction at the peak hour volume traffic signal warrant; or
 2. Where the peak hour volume signal warrant is met without project traffic and delay cannot be measured, project increases traffic by 10 or more vehicles per lane on the controlled approach.
- At a signalized intersection on a Route of Regional Significance (Treat Boulevard, intersections 7-10) result in the volume-to-capacity ratio to exceed 1.5 (LOS F). For intersection where the volume-to-capacity ratio exceeds 1.5 without the project, increase the volume-to-capacity ratio by 0.05²
- The addition of project traffic at a study intersection would result in the 95th percentile vehicle queue exceeding the available storage or would increase 95th percentile queue by more than two vehicles where the queue already exceeds the available storage space (for example, vehicle queues extending beyond the available turn pocket length, impeding travel in the adjacent lanes)

¹ A 5-second increase in delay is not an adopted threshold by Contra Costa County. The CCTA Countywide Transportation Plan EIR (2017) applied a 5 percent change of a particular measure as the basis for an appreciable change, consistent with the approach used in the Plan Bay Area EIR. A 5-second increase in delay is also a common threshold for delay based metrics, which have been used by other agencies within Central Costa County, including Pleasant Hill, Concord and Walnut Creek. This allows for a slight increase in vehicle traffic at an intersection already operating a deficient levels prior to the identification of a significant project-level impact. Projects would still be required to pay all applicable local and regional transportation impact fees to fund regional transportation improvements to the overall system.

² See Footnote 1.

The goal of Contra Costa County is to maintain LOS D during the peak hours, however signalized intersections located along CCTA Congestion Management Plan (CMP) network may operate at LOS F (i.e. intersections 7, 8, 9 and 10) with a volume-to-capacity ratio standard of 1.5 or less.

Bicycle and Pedestrian Network

The CCTA *Countywide Bicycle and Pedestrian Plan (CBPP)*, July 2018, describes related policies necessary to ensure that pedestrian and bicycle facilities are safe and effective for County residents. Using this plan as a guide, significant impacts to these facilities would occur when a project or an element of the project:

- Creates a hazardous condition that currently does not exist for pedestrians and bicyclists, or otherwise interferes with pedestrian accessibility to the site and adjoining areas; or
- Conflicts with an existing or planned pedestrian or bicycle facility; or
- Conflicts with policies related to bicycle and pedestrian activity adopted by CCTA and Contra Costa County.

Transit System

Generally, a project causes a significant impact to transit facilities and services if an element of it conflicts with existing or planned transit services. The evaluation of transit facilities shall consider if:

- A project creates demand for public transit services above the capacity which is provided, or planned;
- A project or project-related mitigation disrupts existing transit services or facilities;³
- A project or project-related mitigation conflicts with an existing or planned transit facility; or
- A project or project-related mitigation conflicts with transit policies adopted by Contra Costa County, CCTA, or County Connection for their respective facilities in the study area.

Vehicle Miles of Travel

According to the *Updated to CEQA Thresholds of Significance and Transportation Impact Study Guidelines* dated December 28, 2018, VMT impacts could have a significant effect on the environment if the project would:

³ This includes disruptions caused by proposed-project driveways on transit streets and impacts to transit stops/shelters; and impacts to transit operations from traffic improvements proposed or resulting from a project.



1. Cause additional VMT per capita, per service population, or other appropriate efficiency measure⁴; or
2. Substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow lanes) or by adding new roadways to the network.

As Contra Costa County has not yet adopted VMT as the CEQA thresholds and still maintains level of service standards, compliance with the updated CEQA guidelines related to transportation is not required until July 1, 2020. Although a VMT analysis is not required, a VMT assessment was prepared for informational purposes, as presented in Chapter 8.

⁴ Based on the latest guidance from OPR, residential development that would generate vehicle travel that is 15 or more percent below the existing residential VMT per capita, measured against the region or city, may indicate a less-than-significant transportation impact. In MPO areas, development measured against city VMT per capita (rather than regional VMT per capita) should not cumulatively exceed the population or number of units specified in the SCS for that city because greater-than-planned amounts of development in areas above the region-based threshold would undermine the VMT containment needed to achieve regional targets under SB 375.

2. Existing Conditions

This chapter describes the existing transportation conditions in the study area including the roadway network, and transit, pedestrian, and bicycle facilities in the vicinity of the project site. Existing parking conditions in the area are also described.

Roadway System

The project site is an unincorporated area of Contra Costa County, north of the City of Walnut Creek, southeast of City of Pleasant Hill and west of the City of Concord. The immediate area surrounding the project site is primarily residential with supporting civic, recreational, educational and commercial uses in close proximity.

Regional access to the site is provided from Treat Boulevard and Interstate 680, with local access provided from Del Hombre Lane and Las Juntas Way. The following discusses the roadways that would provide access to the site and are most likely to experience direct traffic impacts, if any, from the proposed project.

Interstate I-680 is a north-south freeway located east of the project site. In the study area, it provides 5 mixed-flow and one high-occupancy vehicle lane in the southbound direction, and 5 mixed-flow lanes in the northbound direction, in addition to auxiliary lanes between interchanges. In the project area, approximately 260,000 vehicles per day travel on I-680. Access to/from northbound I-680 in the study area is provided from Oak Road on the east side of the freeway. Access to/from southbound I-680 is provided from Main Street at Sunnyvale Avenue. Ramps at Buskirk Avenue also provide freeway access to the area.

Treat Boulevard is an east-west arterial that extends west from Main Street to Clayton Road, connecting Walnut Creek to Concord. West of Main Street, Treat Boulevard continues into the City of Pleasant Hill as Geary Road. Within the study area, Treat Boulevard provides three travel lanes in the westbound direction and four travel lanes in the eastbound direction, with additional turn pockets at intersections. Access to/from I-680 is also provided from I-680. On-street parking is not permitted in the study area and the posted speed limit is 35 miles per hour.

Del Hombre Lane is a north-south local road that connects the residential developments on Honey Trail and Roble Road to Las Juntas Way. Sidewalks are not provided on the west side of the roadway. On the east side of the roadway, sidewalks are not provided between Honey Trail and Roble Road. On-street parking is general allowed.

Las Juntas Way is a local east-west roadway that extends west from Oak Road to Del Hombre Lane where it turns into a north-south street and continues north until Mayhew Way. The road has one travel lane in



each direction. Both sides of the street have continuous sidewalks from Oak Road to Cherry Lane, while between Cherry Lane and Mayhew Way the sidewalk on both sides is intermittent. The posted speed limit is 25 miles per hour. On-street parking is allowed on some portions of the roadway.

Oak Road is a north-south four-lane roadway that provides access from the project site (via Las Juntas Way) to northbound I-680. To the south, it provides access to Downtown Walnut Creek. On-street parking is permitted between Las Juntas Way and Wayne Drive; sidewalks are provided throughout the roadway.

Jones Road is a north-south four lane roadway that connects Treat Boulevard to the BART parking structure entrance. Sidewalks are provided on both sides of the street and no on-street parking is permitted.

Cherry Lane is a north-south two-lane roadway that connects residential neighborhoods north of Treat Boulevard to residential neighborhoods south of Treat Boulevard. Sidewalks are provided along some portions of roadway. Cherry Lane is a commonly used cut-through route from Downtown Walnut Creek to Treat Boulevard.

Pedestrian and Bicycle Facilities

Pedestrian Facilities

Pedestrian facilities include sidewalks, pathways, crosswalks, and pedestrian signals. Sidewalk coverage is not ubiquitous in the study area and there are gaps along sections of Del Hombre Lane, although the Iron Horse Trail is parallel to this street. Most of the residential streets in the area have sidewalks. There are several painted, all-stop intersections in the study area that include trail crossings on Las Juntas Way with Del Hombre Lane and Las Juntas Way with Coggins Drive, although there are not any high-visibility crosswalks with pedestrian actuated warning light systems. Crosswalks are not provided across Del Hombre Lane at Las Juntas Way.

Bicycle Facilities

Bicycle facilities include the following general types:

- Class I: Shared Use Path – These facilities provide a completely separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicle cross-flow minimized.
- Class II: Bicycle Lane – Bicycle lanes provide a restricted right-of-way and are designated for the use of bicycles for one-way travel with a striped lane on a street or highway. Bicycle lanes are generally a minimum of five feet wide. Vehicle/pedestrian cross-flow are permitted.

- Class III: Bicycle Route with Sharrows – These bikeways provide right-of-way designated by signs or pavement markings for shared use with motor vehicles. These include sharrows or “shared-lane markings” to highlight the presence of bicyclists.
- Class IV: Buffered Bicycle Lanes – Bicycle lanes that include a physically separated lane for increased comfort and protection of cyclists. Can be physically separated by a barrier, such as planters or on-street parking, grade-separated from the roadway, or a painted buffer area. These can also be called cycle-tracks, and can allow for one-way or two-way bicycle travel.

Figure 3 shows the location of various bicycle facilities in the study area, which includes Class I facility on Iron Horse Regional Trail, and the Canal Trail and Class III bicycle facilities on portions of Coggins Drive. Class II facilities are also provided in the area.

The Iron Horse Regional Trail is a shared use path that crosses Las Juntas Way approximately 100-feet west from Del Hombre Lane. This 32-mile trail runs north-south connecting the cities of Concord and Pleasanton. From the Iron Horse Regional Trail, connections can be made to other regional trails.

Transit Service

Transit service in the area is primarily provided by The County Connection and Bay Area Rapid Transit (BART), with existing transit routes in the area shown on **Figure 4**.

The County Connection provides fixed route, express route, school service and paratransit transit service within and connecting to Central Contra Costa County. The study area is served by numerous routes, including Routes 7, 9, 11, 14, 15, and 18, which connect the Pleasant Hill BART Station to a number of destinations, including Diablo Valley College (DVC), Downtown Walnut Creek, Downtown Pleasant Hill, Downtown Concord, Shadelands Business Park, numerous schools, residential areas, and commercial areas along the way. Depending on the route, service is provided on headways ranging from 15 to 45-minutes during peak commute periods and 60 to 90 minutes off-peak.

Bay Area Rapid Transit (BART) provides regional transportation connections to much of the Bay Area and the Antioch line provides direct access to San Francisco, with several stops in Oakland where connections may be made to other lines. The project is located approximately 500-feet from the Pleasant Hill/Contra Costa Center Station. BART train frequency ranges between 6-20 minutes from approximately 5:00 AM to 12:00 AM. Based on 2018 data from BART, approximately 8,000 passengers per day enter/exit the BART system at the Pleasant Hill/Contra Costa Center Station.

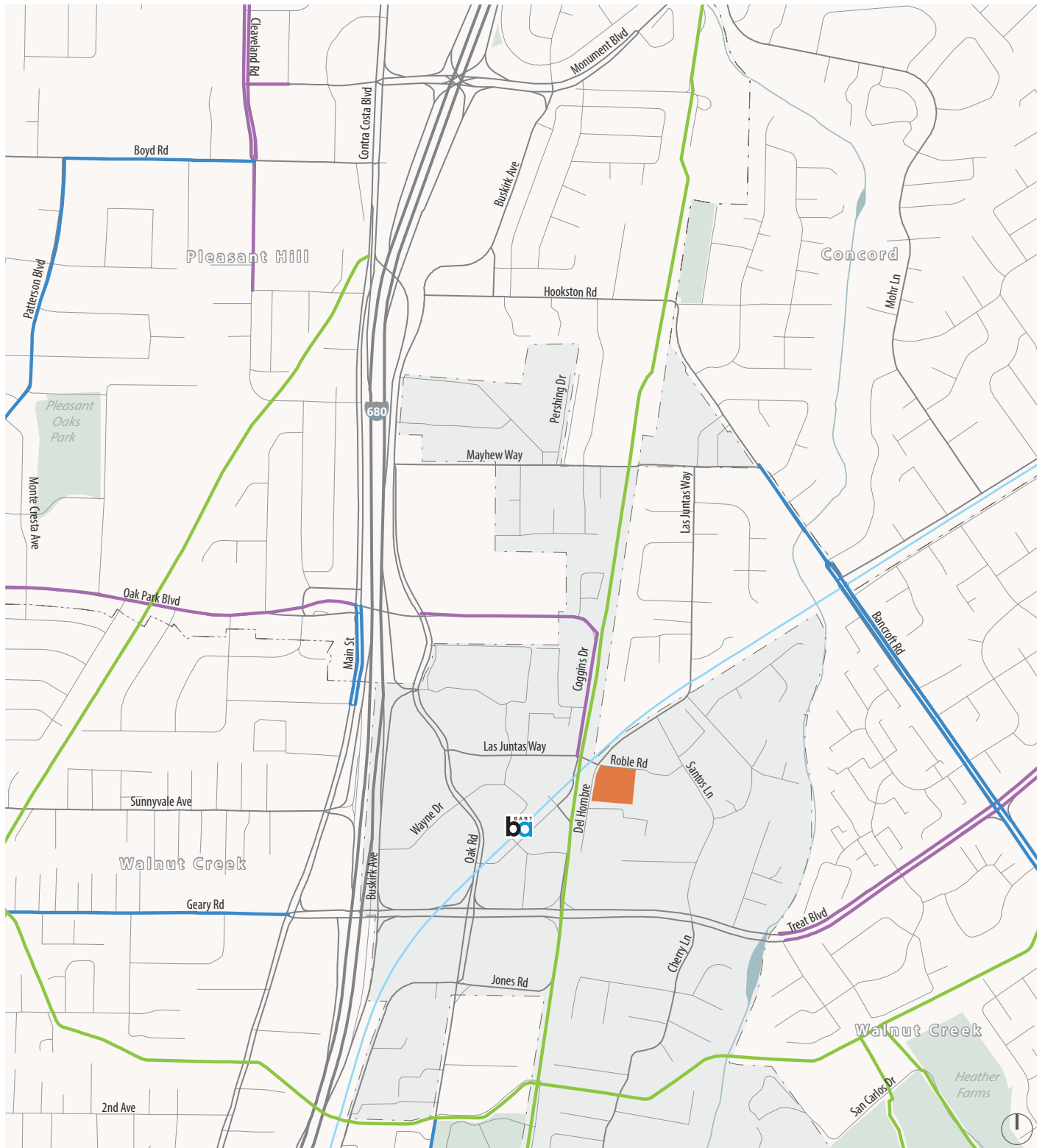
Limited transit service is also provided by other service providers, including:

AC Transit Route 702 provides non-stop, one-way service from the BART Pleasant Hill/Contra Costa Centre Station stop (Pleasant Hill BART) to the Transbay Terminal in San Francisco. This route operates Monday through Friday from 4:24 AM to 5:30 AM with approximately 15 minute headways. The nearest bus stop for this route is adjacent to the Pleasant Hill BART station, located 0.11 mile southwest of the project site.

Solano Express operates Routes Y (Yellow Line) and B (Blue Line) in the study area. Route Y provides service between the Vallejo Transit Center and Walnut Creek BART with scheduled stops at the Vallejo Ferry Terminal, Curtola Park & Ride in Vallejo, Military at First City Park in Benicia, Contra Costa Boulevard in Pleasant Hill, and Pleasant Hill BART. This route operates Monday through Friday from 5:27 AM to 10:17 AM with 30 minute headways during peak periods and 60 minute headways off-peak. The route operates on Saturday from 6:20 AM to 9:43 PM with approximately 100 minute headways, and on Sunday from 8:00 AM to 9:43 PM with approximately 100 minute headways. The nearest bus stop for this route is adjacent to the Pleasant Hill BART station, located 0.11 mile southwest of the project site.

Route B provides service between the Sacramento Valley Station and Pleasant Hill BART with scheduled stops at 9th Street and L Street in Sacramento, The UC Davis Silo, Dixon Park & Ride, Vaca Valley Parkway in Vacaville, The Vacaville Transportation Center, The Fairfield Transportation Center, Suisun Valley Road in Fairfield, and the Benicia Bus Hub. This route operates Monday through Friday from 4:19 AM to 8:31 PM with approximately 20 to 40 minute headways during peak periods and 60 minute headways off-peak. The route operates on Saturday from 8:00 AM to 7:39 PM with approximately 60 minute headways. The nearest bus stop for this route is adjacent to the Pleasant Hill BART station, located 0.11 mile southwest of the project site.

Wheels Bus operates Route 70X in the study area, the provides service between the E. Dublin BART Station and Pleasant Hill BART with scheduled stops at Walnut Creek BART. This route operates Monday through Friday from 5:43 AM to 8:51 PM with 30 minute headways, and from 4:03 PM to 7:13 PM with approximately 30 minute headways. The nearest bus stop for this route is adjacent to the Pleasant Hill BART station, located 0.11 mile southwest of the project site.



- Project Site
- Study Intersection
- Class I Bicycle Path
- Class II Bicycle Lane
- Class III Bicycle Route



Figure 3

Existing Bicycle Facilities

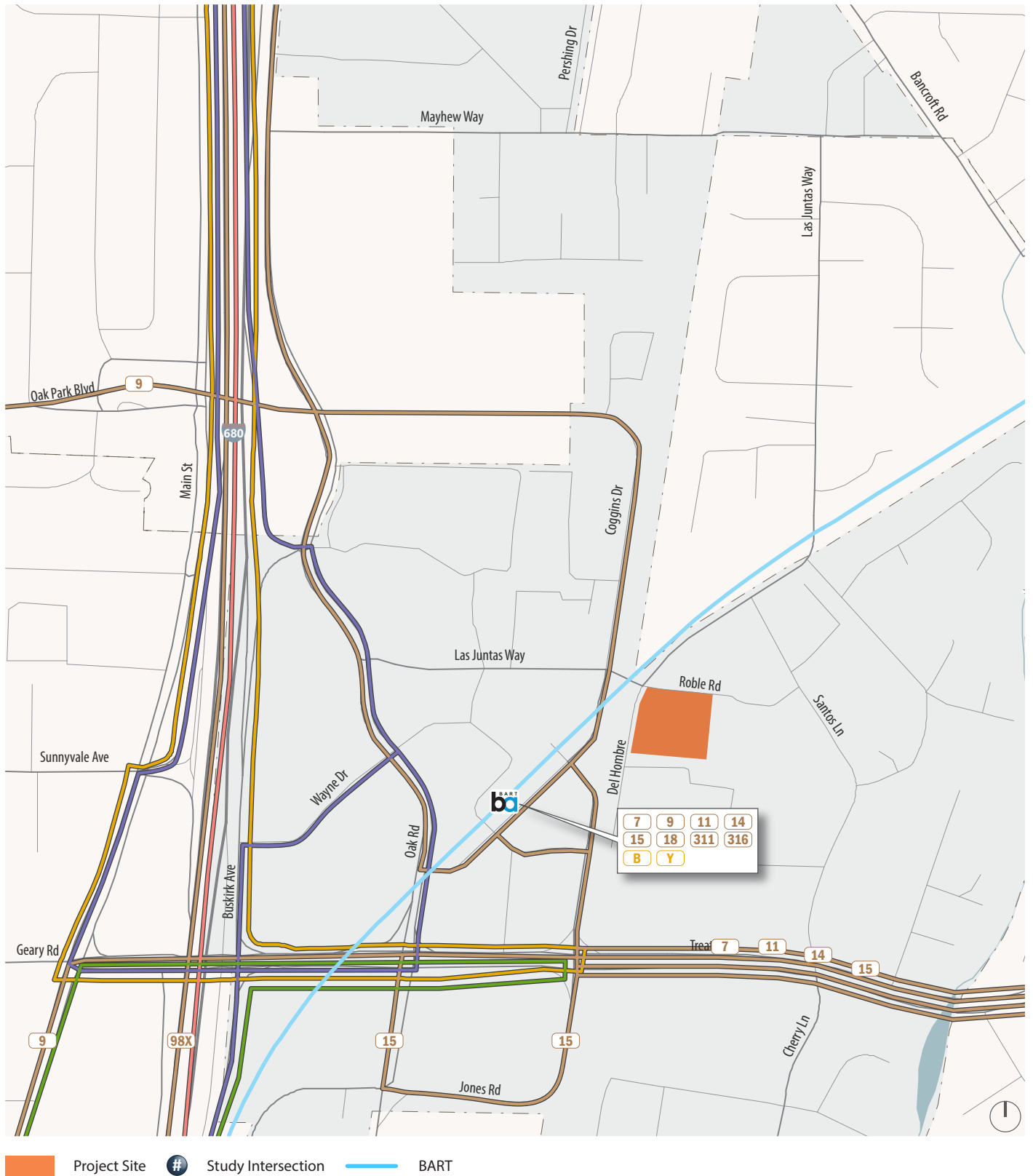


Figure 4

Existing Transit Facilities

Existing Traffic Counts

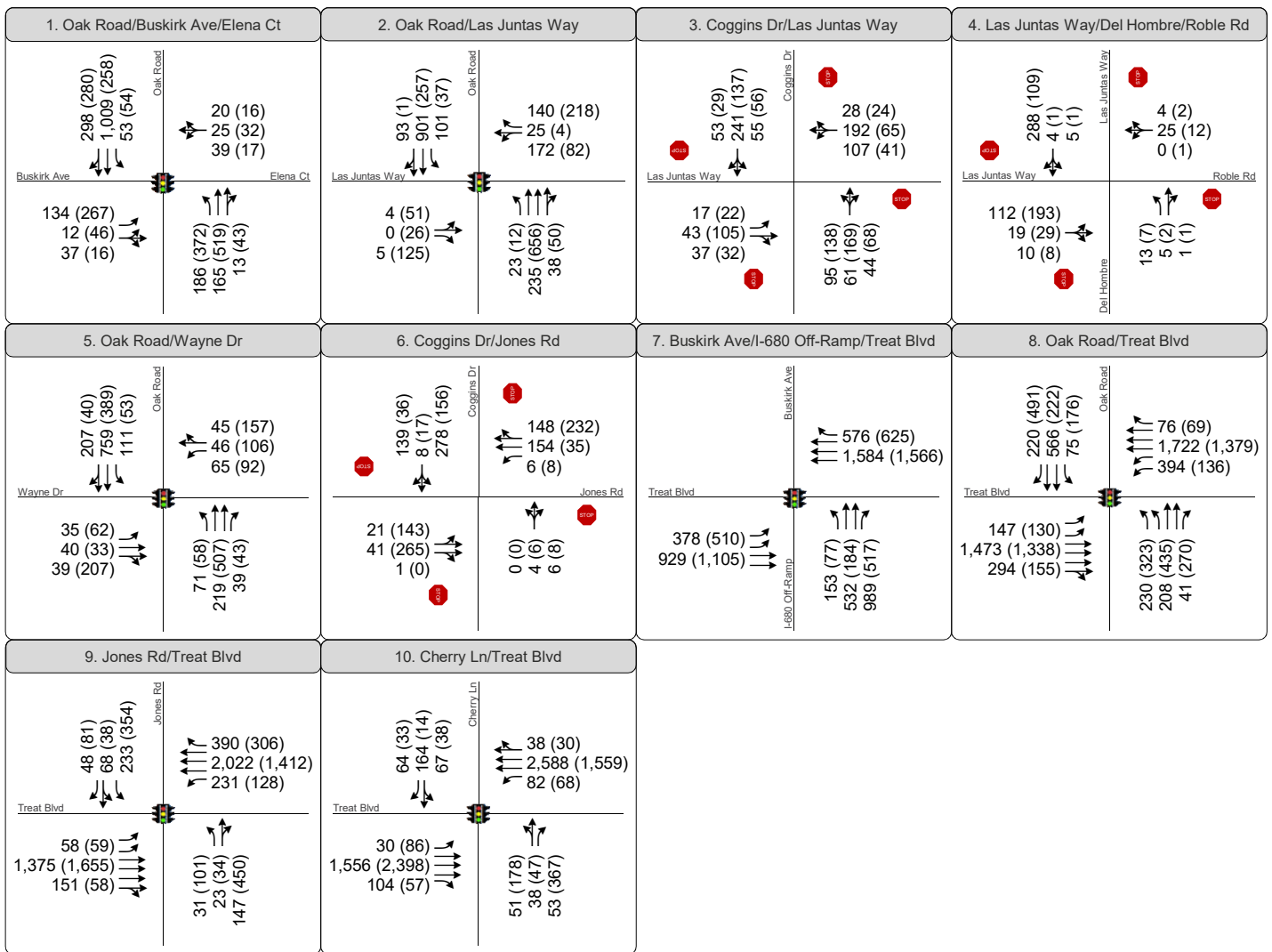
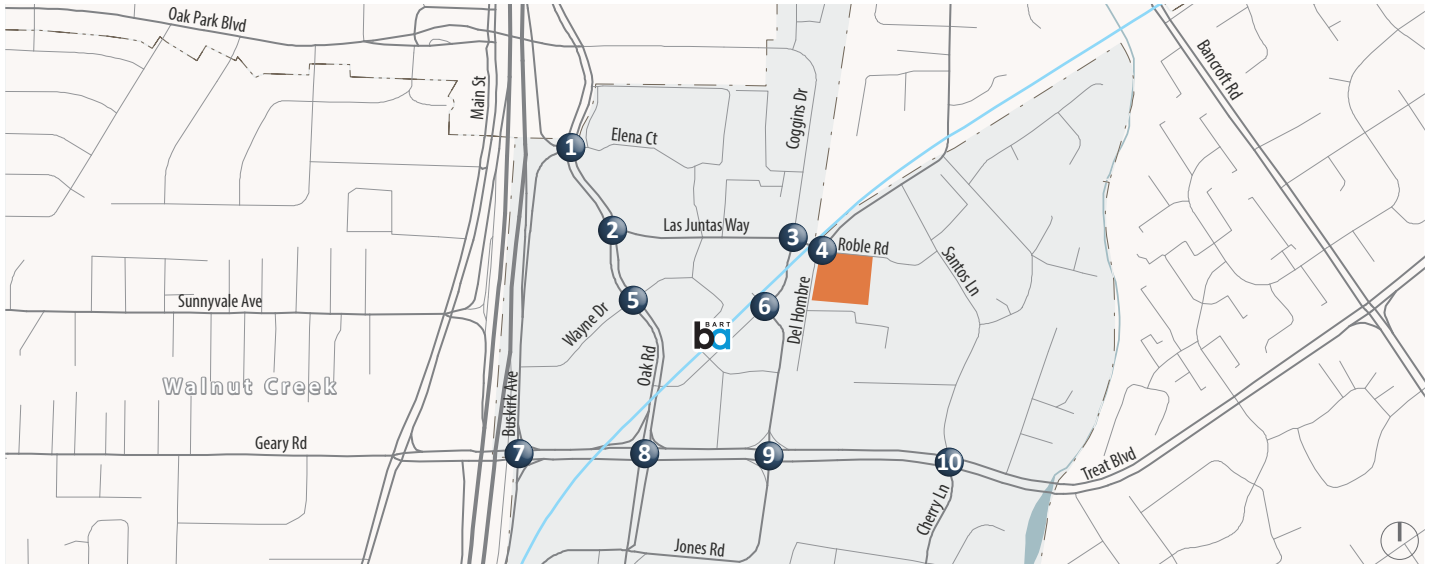
Weekday morning (7:00 to 9:00 AM) and weekday evening (4:00 to 6:00 PM) peak period intersection turning movement counts were conducted at the study intersections, in addition to separate counts of pedestrians, bicycles and heavy vehicles in November and December of 2018. For each of the count periods, a global peak hour was identified. The weekday AM and PM peak hours were identified to be 7:45 to 8:45 AM and 4:30 to 5:30 PM, respectively. The peak hour volumes are presented on **Figure 5** along with the existing lane configuration and traffic control. Existing bicycle and pedestrian volumes are shown on **Figure 6**. Traffic count worksheets are provided in **Appendix A**.

Existing Operations

Intersection Levels of Service

Existing operations were evaluated using the methodology described in Chapter 1. The results are summarized in **Table 3** based on the HCM, 6th Edition method unless otherwise specified. Observed peak hour factors⁵ were used at all intersections, and truck, pedestrian and bicycle activity were factored into the analysis. Study intersections operate within at overall service level standards set by Contra Costa County and CCTA during both the weekday morning and weekday evening peak hours, which was confirmed during field observations. High levels of delay are expected at the Treat Boulevard at Cherry Lane intersection during both peak hours, but the intersection operates within the established benchmark. Detailed intersection LOS calculation worksheets are provided in **Appendix C**.

⁵ The relationship between the peak 15-minute flow rate and the full hourly volume is given by the peak-hour factor (PHF) based on the following equation: $PHF = \text{Hourly volume} / (4 * \text{volume during the peak 15 minutes of flow})$. The analysis of level of service is based on peak rates of flow occurring within the peak hour because substantial short-term fluctuations typically occur during an hour.

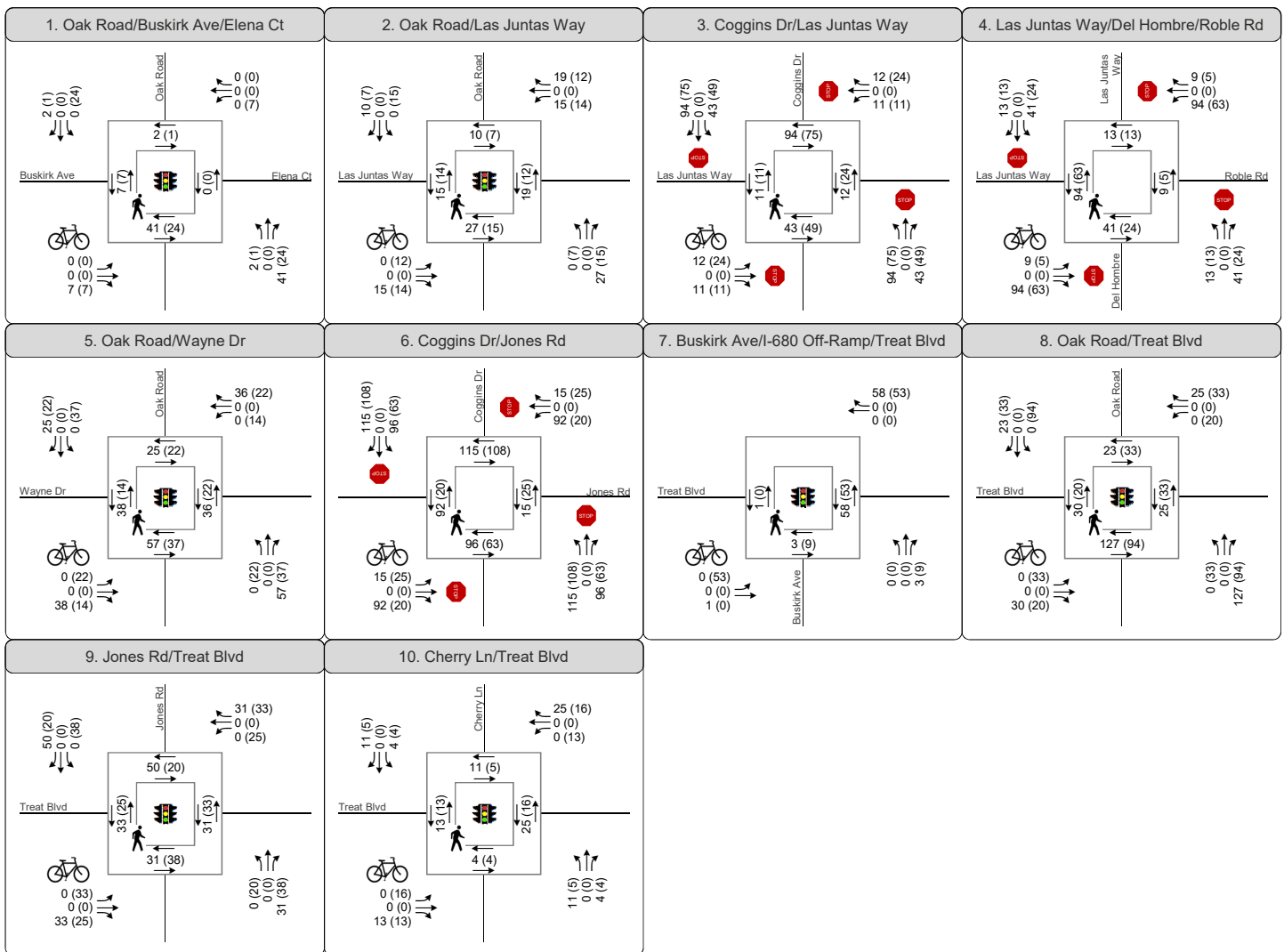
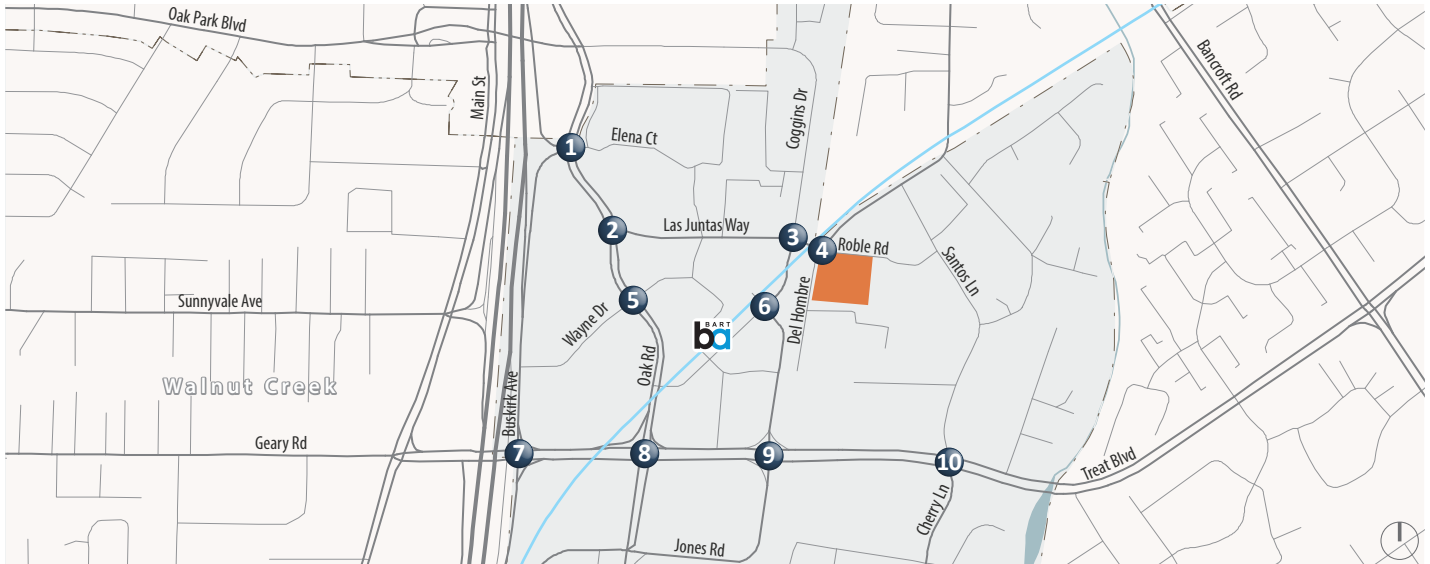


XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection



Figure 5
Existing Conditions Peak Hour
Traffic Volumes, Lane Configurations and Traffic Controls



XX (YY) AM (PM) Peak Hour Bicycle Volumes
 XX (YY) AM (PM) Peak Hour Pedestrian Volumes
 Signalized Intersection
 Stop Sign

Project Site
 Study Intersection



Figure 6
Existing Conditions Peak Hour
Bicycle and Pedestrian Volumes

Table 3: Existing Conditions - Peak Hour Intersection Levels of Service

Intersection	Control ¹	Peak Hour	Existing Conditions	
			Delay ³	LOS
1. Oak Road at 680 on-ramp and Buskirk Avenue	Signalized	AM PM	28 23	C C
2. Oak Road at Las Juntas Way	Signalized	AM PM	8 8	A A
3. Coggins Drive at Las Juntas Way	AWSC	AM PM	18 14	C B
4. Del Hombre Lane at Roble Road	AWSC	AM PM	9 9	A A
5. Oak Road at Wayne Drive	Signalized	AM PM	22 21	C C
6. Coggins Drive at Jones Road	AWSC	AM PM	18 14	C B
7. Treat Boulevard at Buskirk Avenue ²	Signalized	AM PM	22 18	C B
8. Treat Boulevard at Oak Road ²	Signalized	AM PM	33 36	C D
9. Treat Boulevard at Jones Road ²	Signalized	AM PM	47 53	D D
10. Treat Boulevard at Cherry Lane ²	Signalized	AM PM	98 (0.82) 141 (0.81)	F F

Notes: **Bold** indicates operations below the intersection LOS standard for acceptable operations.

1. AWSC = All-way Stop Controlled; signalized = traffic signal control

2. Volume-to-Capacity ratio shown in parenthesis when LOS value is E or F.

3. Delay shown in seconds.

Source: Fehr & Peers, 2019.

Although the study intersections are shown to operate within service level standards, significant levels of traffic diversion from I-680 and other regional travel routes can occur through the study area when there is recurring and non-recurring congestion on other routes. Congestion on I-680, State Route 242, State Route 24, and State Route 4 can influence the operations of intersections in the study area – for example, when there are incidents on SR 4 and/or SR 242, additional traffic from eastern Contra Costa County uses Treat Boulevard and Ygnacio Valley Road to access I-680, State Route 24, and other employment centers. This can result in vehicle queue spillback along Treat Boulevard. The data collection effort and subsequent analysis is reflective of a day when there was not a major incident that resulted in atypical traffic diversion through the study area. Analyzing the effects of project traffic on roadway operations considering increased traffic diversion due to non-recurring incidents on the regional transportation system would serve to dilute the effects of project traffic and would reduce the projects proportionate share to potential impacts.

Vehicle Queues

Although all intersections currently operate within the standards set by Contra Costa County and CCTA, there can be periodic vehicle queue spillback and delays greater than shown in Table 3 for some movements. For signalized intersections, **Table 4** presents the 95th percentile vehicle queue results for turn movements with exclusive lanes. Queue worksheets are provided in **Appendix C**.

Table 4: Existing Conditions – 95th Percentile Queue Summary

Intersection	Movement	Storage Length (ft) ¹	AM Peak Period	PM Peak Period
1. Oak Road at 680 on-ramp and Buskirk Avenue	EBL	170	170	225
	NBL	150	300	500
	SBL	130	125	100
2. Oak Road at Las Juntas Way	EBR	170	25	50
	WBR	110	50	75
	NBL	150	75	50
	SBL	170	150	75
5. Oak Road at Wayne Drive	EBL	260	75	100
	WBL	220	100	125
	NBL	240	125	100
	NBR	240	25	25
	SBL	190	150	100
7. I-680 Off-Ramp/Treat Boulevard	EBL	275	250	375
	NBL	300	225	125
	NBR	1,200	1,725	750
8. Treat Boulevard at Oak Road	EBL	150	75	100
	WBL	240	250	125
	WBR	610	50	50
	NBL	260	175	250
	NBR	240	25	100
	SBL	275	150	350
	SBR	120	175	650
9. Treat Boulevard at Jones Road	EBL	380	50	75
	WBL	200	425	200
	WBR	350	300	175
	NBL	370	75	150

Table 4: Existing Conditions – 95th Percentile Queue Summary

Intersection	Movement	Storage Length (ft) ¹	AM Peak Period	PM Peak Period
10. Treat Boulevard at Cherry Lane	SBL	240	225	275
	SBR	370	25	25
	EBL	190	75	250
	EBR	275	25	50
	WBL	180	225	200
	NBR	110	50	500
	SBR	70	75	25

Notes: **Bold** indicates queue potentially extends beyond available storage.

-- = intersection was not evaluated for this time period.

1. An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

Source: Fehr & Peers, 2019.

Peak Hour Signal Warrants

Peak hour traffic signal warrants were reviewed at the unsignalized study intersections. Peak hour warrants⁶ are not met at any of the unsignalized study intersection based on existing traffic volumes. Peak hour signal warrant worksheets are provided in **Appendix D**.

⁶ Unsignalized intersection warrant analysis is intended to examine the general correlation between existing conditions and the need to install new traffic signals. Existing peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the Manual on Uniform Traffic Control Devices (MUTCD) and associated State guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The responsible State or local agency should undertake regular monitoring of actual traffic conditions and accident data and conduct a timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

3. Project Characteristics

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, trip distribution, and trip assignment characteristics, allowing for an evaluation of project impacts on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic entering/exiting the site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the area was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

Project Description

The project would construct a six-level, 284-unit apartment building on an approximately 2.40 acre undeveloped site. The site is bound by Del Hombre Lane to the west, Roble Road (private road) to the north, Honey Trail (private road) to the south, and residential development to the east. All vehicular site access would be provided from a new driveway on Del Hombre Lane that would serve an approximately 380 space parking structure. Pedestrian access to ground floor units would be provided from Del Hombre Lane and Roble Road. Pedestrian access would also be provided at the main entrance proposed on Del Hombre Lane at Honey Trail, where a stairwell and elevators are proposed. From within the parking garage, access to two sets of elevators is also provided as well as a stairwell. A secondary fire access would be provided from Roble Road on the east side of the building. The project is located in close proximity to the Iron Horse Regional Trail (across the street) and a Bay Area Rapid Transit (BART) station (approximately 500 feet).

Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project might add to the local roadway network. In addition to estimates of daily traffic, estimates are also created for the peak one-hour periods during the weekday morning (AM) and evening (PM) commute hours, when traffic volumes on adjacent streets are typically at their highest. Given the projects proximity to a BART station and other connecting transit services, as well as its proximity to a Class I bicycle and pedestrian path that provides non-motorized connections to the north and south, a higher percentage of trips to and from the site are expected to be transit, walk and bicycle trips as compared to a more traditional suburban development.

Several sources of trip generation data were reviewed in the development of project trip generation estimates, including rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition), trip generation studies conducted by Fehr & Peers for apartment complexes in the area, including the Park Regency Apartments and AvalonBay Community, as well as journey to work data for census tracts in the study area. Additionally, a study conducted by Fehr & Peers to document Transportation Network Company (TNC) use, such as Lyft and UBER, at a wide variety of land use types was also reviewed to determine if a portion of project trips could be ride-sharing trips.

Review of the data indicates that ITE trip generation rates alone could over-estimate vehicle trip generation as compared to projects surveyed in the project vicinity, as the ITE rates are based on surveys on apartment uses in suburban settings, not well served by transit. Additionally, the local survey data was collected before the use in use of TNCs, which could account for approximately 5 percent of trips to a residential complex such as the proposed project. Review of census data indicates the people who live in the project area take transit, walk or bike to work at a much higher rate than residents elsewhere in the county (approximately 25 percent take transit to work and 5 percent walk or bike to work in the project area, as compared to less than 10 percent transit mode and less than 2 percent walk/bike mode for the county on average).

To estimate the vehicle trip generation for this project, ITE rates were used as a starting point. They were then reduced by 20 percent to account for additional⁷ transit, walk, and bicycle trips as compared to a typical apartment building given the projects location adjacent to BART, and the proximity to a number of employment centers. Vehicle trip generation was also increased by 5 percent to account for TNC use, with the resulting trip generation estimates presented in **Table 5**. TNC use results in a vehicle trip generation increase as each TNC trip counts for two trips – one inbound and one outbound. The TNC factor was based on observations conducted by Fehr & Peers staff at similar land uses in urban and suburban contexts.

The project is expected to generate approximately 1,800 vehicle trips on a daily basis, including 109 morning peak hour trips and 128 evening peak hour trips. The resulting vehicle trip generation rate per unit was then calculated and compared to observed data from area apartments. This comparison shows that the resulting trip generation estimates are within the range of surveyed apartment complexes in the area on a per-unit basis.

⁷ The ITE rates include a nominal level of walking, bicycling and transit use.

Table 5: Project Trip Generation

Use	Size	Week-day Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Apartments	284 Dwelling Units	2,110	30	99	129	91	59	150
Additional Transit, Walk, Bike	20 percent reduction	-420	-6	-20	-26	-18	-12	-30
TNC Factor	5 percent increase	110	3	3	6	4	4	8
Net New Trips:		1,800	27	82	109	77	51	128

1. ITE land use category 220 – Multi-Family Housing Mid-Rise (Adj. Streets, 7-9A, 4-6P) based on suburban locations:

Weekday Daily: $T = 7.56 (X)^{-40.86}$

Weekday AM Peak Hour: $\ln(T) = 0.95 \ln(X) - 0.51$; Enter = 23%; Exit = 77%

Weekday PM Peak Hour: $\ln(T) = 0.89 \ln(X) - 0.02$; Enter = 63%; Exit = 37%

Source: *Trip Generation Manual* (10th Edition), ITE; Fehr & Peers.

Trip Distribution & Assignment

Project trip distribution refers to the directions of approach and departure that vehicles would take to access and leave the site. Estimates of project trip distribution were developed based on existing travel patterns in the area, a select zone analysis using the Contra Costa Transportation Authority (CCTA) travel demand model, the location of complementary land uses, and existing travel patterns in the area. The resulting trip distribution percentages are shown on **Figure 7**. Project trips were assigned to the roadway network based on the general directions of approach and departure, with the project trip assignment shown on **Figure 8**.

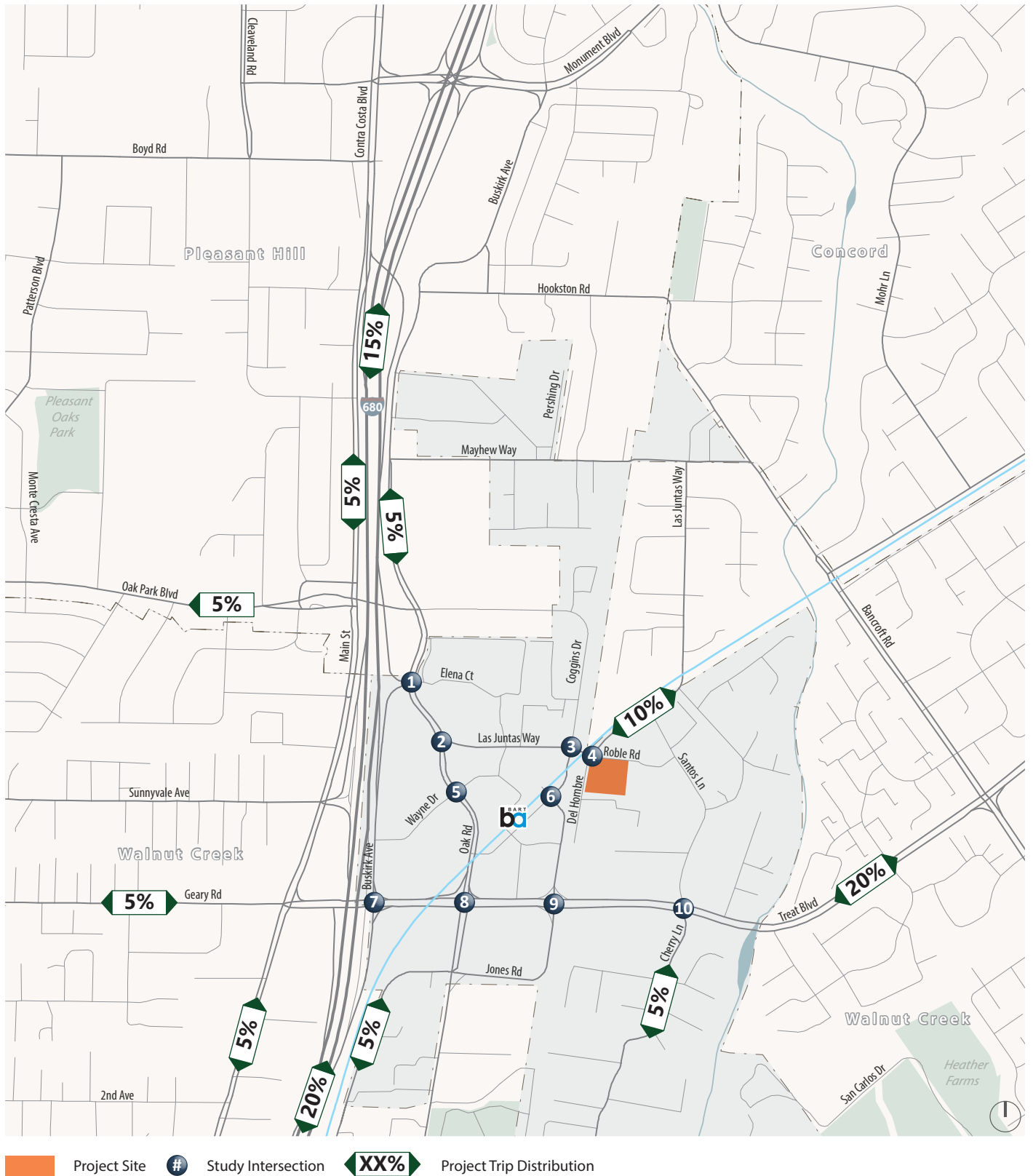
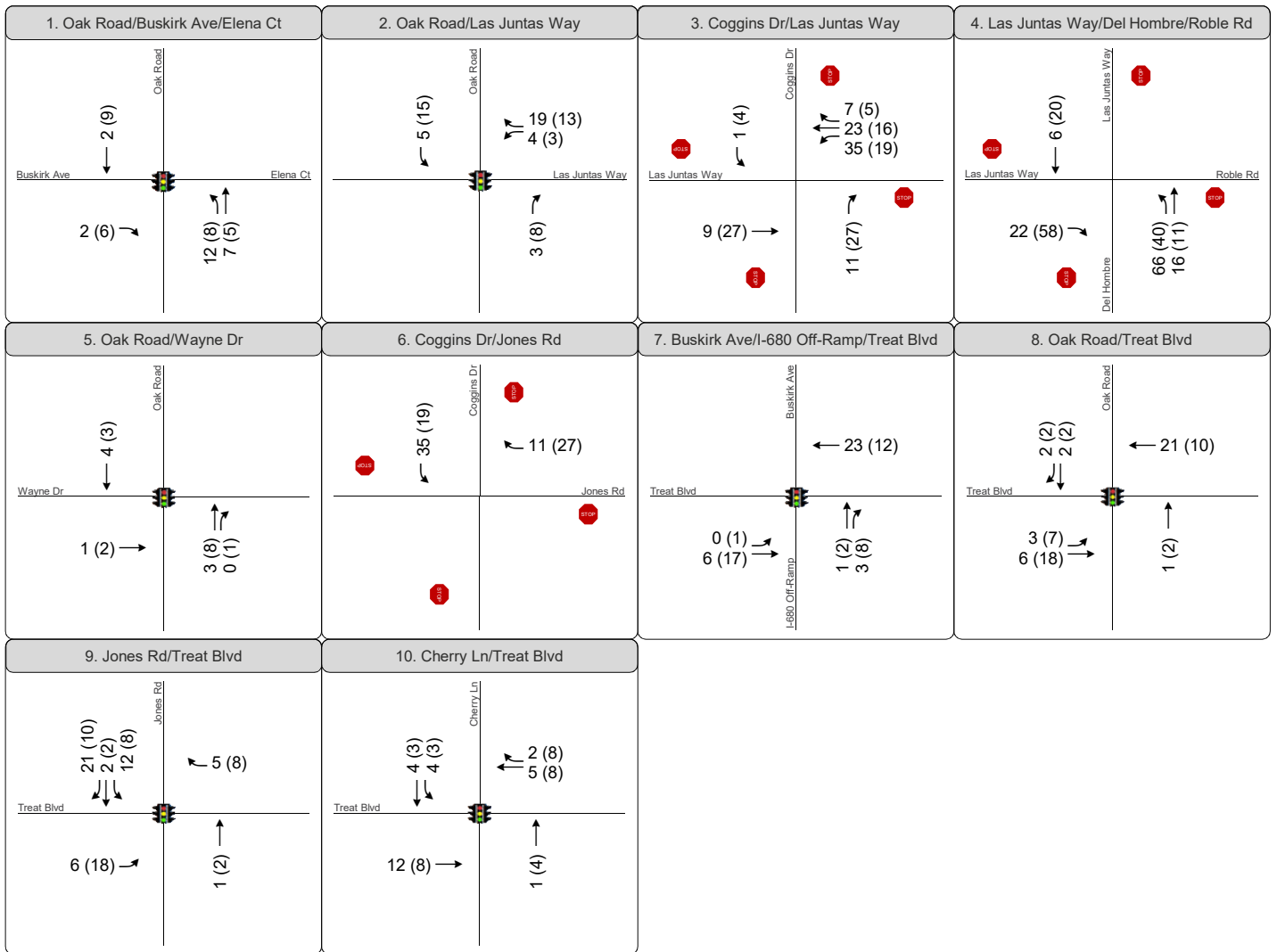
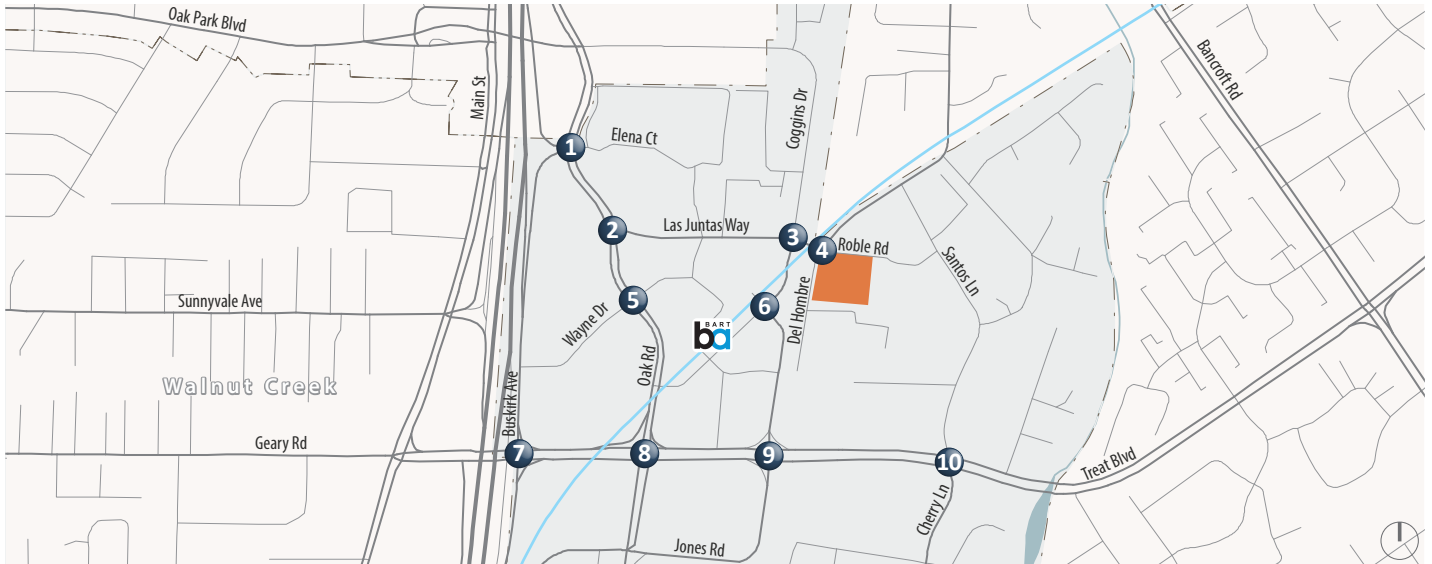


Figure 7

Project Trip Distribution



XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection



Figure 8



4. Existing with Project Conditions

This chapter evaluates potential off-site traffic impacts under Existing with Project conditions.

Existing with Project Traffic Volumes and Roadway Improvements

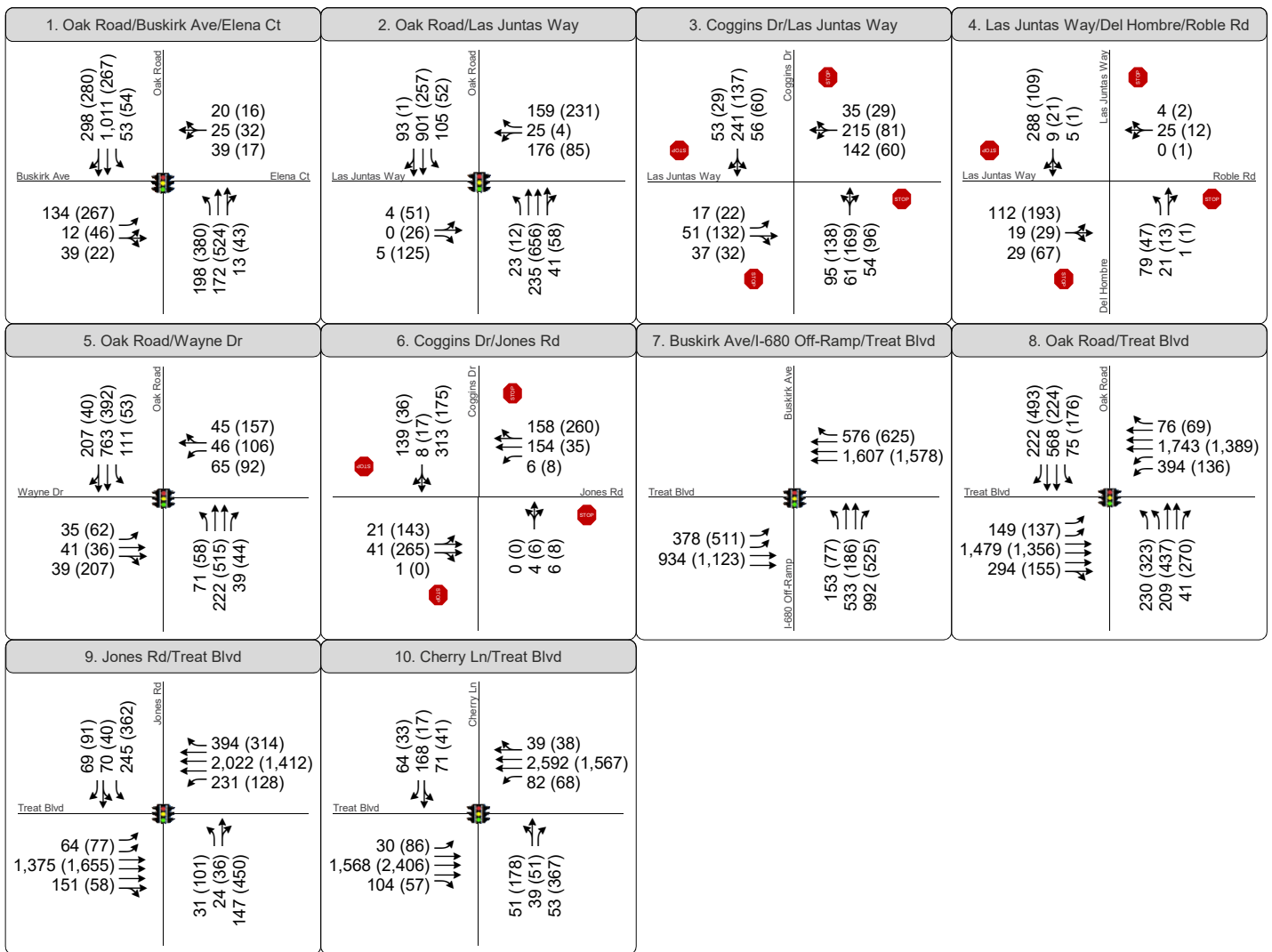
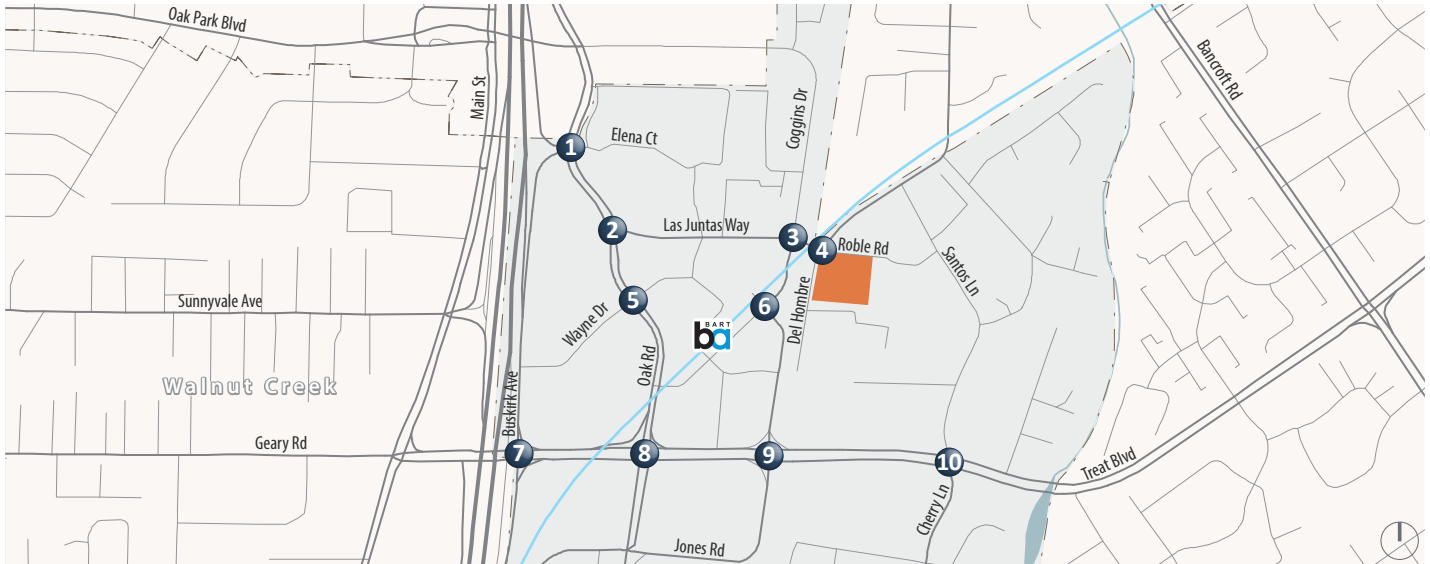
Project-only traffic volumes (Figure 8) were added to the existing peak hour traffic volumes (Figure 5) to estimate Existing with Project peak hour intersection turning movement volumes, as shown on **Figure 9**.

Traffic signal timings, peak hour factors, heavy vehicle percentages, and pedestrian and bicycle activity at the study intersections were left unchanged from existing conditions. No intersection improvements were considered in the evaluation of With Project conditions.

Analysis of Existing with Project Conditions Intersection Levels of Service

Existing with Project conditions were evaluated using the same methods described in Chapter 1. The analysis results are presented in Table 6, based on the traffic volumes and lane configurations presented on Figure 9. Table 6 also includes the operations results for the Existing without Project conditions for comparison purposes.

The addition of project traffic would not degrade the operation of any study intersection from an overall acceptable service level to an unacceptable service level. For intersections on Treat Boulevard that experience LOS F conditions from a delay perspective operate within the established volume-to-capacity ratio standard and while the addition of project traffic would increase the volume-to-capacity ratio, this increase is not considered significant based on the standards outlined in Chapter 1. Detailed intersection LOS calculation worksheets are provided in **Appendix C**.



XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection



Figure 9

Existing with Project Peak Hour Traffic Volumes, Lane Configurations and Traffic Controls

Table 6: Existing with Project Conditions - Peak Hour Intersection Levels of Service

Intersection	Control ¹	Peak Hour	Existing Conditions		Existing with Project Conditions			
			Delay ³	LOS	Delay ³	LOS	Signal Warrant Met?	Impact?
1 Oak Road at 680 on-ramp and Buskirk Avenue	Signalized	AM PM	28 23	C C	29 23	C C	N/A N/A	No No
2 Oak Road at Las Juntas Way	Signalized	AM PM	8 8	A A	9 9	A A	N/A N/A	No No
3 Coggins Drive at Las Juntas Way	AWSC	AM PM	18 14	C B	24 17	C C	No No	No No
4 Del Hombre Lane at Roble Road	AWSC	AM PM	9 9	A A	10 10	A A	No No	No No
5 Oak Road at Wayne Drive	Signalized	AM PM	22 21	C C	22 21	C C	N/A N/A	No No
6 Coggins Drive at Jones Road	AWSC	AM PM	18 14	C B	22 15	C B	No No	No No
7 Treat Boulevard at Buskirk Avenue ²	Signalized	AM PM	22 18	C B	22 18	C B	N/A N/A	No No
8 Treat Boulevard at Oak Road ²	Signalized	AM PM	33 36	C D	33 36	C D	N/A N/A	No No
9 Treat Boulevard at Jones Road ²	Signalized	AM PM	47 53	D D	47 54	D D	N/A N/A	No No
10 Treat Boulevard at Cherry Lane ²	Signalized	AM PM	98 (0.82) 141 (0.81)	F F	109 (0.83) 146 (0.81)	F F	N/A N/A	No No

Notes: **Bold** indicates operations below the intersection LOS standard for acceptable operations.

1. AWSC = All-way Stop Controlled; signalized = traffic signal control
2. Volume-to-Capacity ratio shown in parenthesis when LOS value is E or F.
3. Delay shown in seconds.

Source: Fehr & Peers, 2019.

Vehicle Queues

Vehicle queues were assessed for the signalized intersections in the with project condition, and the addition of project traffic is not expected to cause vehicle queues to increase by more than 50-feet (or 2 car-lengths) for movements where the 95th percentile queue already exceeds the available storage or result in vehicle queues to exceed the available storage, as presented in **Table 7**.. Queue worksheets are provided in **Appendix C**.

Table 7: Existing with Project Conditions – 95th Percentile Queue Summary

Intersection	Move ment	Storage Length (ft) ¹	AM Peak Period		PM Peak Period	
			Without Project	With Project	Without Project	With Project
1. Oak Road at 680 on-ramp and Buskirk Avenue	EBL	170	170	175	225	225
	NBL	150	300	300	500	525
	SBL	130	125	125	100	100
2. Oak Road at Las Juntas Way	EBR	170	25	25	50	50
	WBR	110	50	75	75	75
	NBL	150	75	75	50	50
	SBL	170	150	155	75	100
5. Oak Road at Wayne Drive	EBL	260	75	75	100	100
	WBL	220	100	100	125	125
	NBL	240	125	125	100	100
	NBR	240	25	25	25	25
	SBL	190	150	150	100	100
7. I-680 Off- Ramp/Treat Boulevard	EBL	275	250	250	375	375
	NBL	300	225	225	125	125
	NBR	1,200	1,725	1,725	750	775
8. Treat Boulevard at Oak Road	EBL	150	75	75	100	100
	WBL	240	250	250	125	125
	WBR	610	50	50	50	50
	NBL	260	175	175	250	250
	NBR	240	25	25	100	100
	SBL	275	150	150	350	350
	SBR	120	175	175	650	650
9. Treat Boulevard at Jones Road	EBL	380	50	50	75	75
	WBL	200	425	425	200	200
	WBR	350	300	300	175	175
	NBL	370	75	75	150	150
	SBL	240	225	225	275	300
	SBR	370	25	25	25	50
10. Treat Boulevard at Cherry Lane	EBL	190	75	75	250	250
	EBR	275	25	25	50	50
	WBL	180	225	225	200	200
	NBR	110	50	50	500	500

Table 7: Existing with Project Conditions – 95th Percentile Queue Summary

Intersection	Move ment	Storage Length (ft) ¹	AM Peak Period		PM Peak Period	
			Without Project	With Project	Without Project	With Project
	SBR	70	75	75	25	25

Notes: **Bold** indicates queue potentially extends beyond available storage.

Bold Italics indicates potentially significant impact.

-- = intersection was not evaluated for this time period.

1. An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

Signal Warrants

Signal warrants were evaluated for the unsignalized intersections. As shown in Table 6, signalization of the unsignalized study intersections is not warranted with the addition of project traffic in the existing condition. Signal warrant worksheets are provided in **Appendix D**.

Construction Assessment

The assessment of construction activity considers construction vehicles (including vehicles removing or delivering fill material, bulldozers, and other heavy machinery, as well as building materials delivery) and construction worker activity.

Based on the preliminary construction schedule, export of approximately 29,000 cubic yards of material is expected over an approximately 50 day period. With a capacity of approximately 14 cubic yards per dump truck, this would equate to approximately 84-truck trips per day (42 inbound and 42 outbound) during the site preparation phase. Truck traffic would follow designated truck routes. After site grading is complete, other construction vehicles would be used, but it is expected that equipment would be staged on the site prior to beginning work and would be removed vehicles at project completion. As such, a daily influx of construction equipment is unlikely.

Additional construction related details are not available and additional analysis may need to be conducted to determine the projects effect during the construction period, as there could be temporary significant impacts.



Existing Conditions Impacts and Mitigation

No off-site intersection impacts were identified in the existing condition. However, there could be temporary significant impacts during the construction phase of the project.

Impact Statement 1: Construction related activities could create potential conflicts with other roadway users, such as construction related activities resulting in lane closures along the project frontage, construction vehicles queuing within the public right-of-way waiting entry to the site, construction worker parking in non-designated parking areas, or construction debris on public streets. Construction impacts would be temporary in nature; however, this impact is considered **potentially significant**.

Mitigation Measure 1: Although construction impacts would be temporary, development of a construction management plan for review and approval by the County Public Works Department would reduce the potential for construction vehicle conflicts with other roadway users. The plan should include:

- Project staging plan to maximize on-site storage of materials and equipment
- Permitted construction hours
- Location of construction staging
- Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations
- Provisions for street sweeping to remove construction related debris on public streets
- A set of comprehensive traffic control measures including preparation of traffic control plans, as needed; scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction haul routes
- Survey of the pavement condition on roadways to be used as part of haul route prior to the commencement of any work on site. The survey shall include a video tape of the roadways. The applicant shall complete any remedial work prior to initiation of use and provide a bond assuring completion of the remediation work, the amount which shall be deemed sufficient by the Public Works Department.
- The applicant shall provide a pavement analysis for those roads along the proposed haul routes or any alternate route(s) that are proposed to be utilized by hauling operation. This study shall analyze the existing pavement conditions and determine what impact the hauling operation will have over the construction period of the project. The study shall provide recommendations to mitigate identified impacts.

Implementation of the construction management plan would reduce the temporary construction impact to a **less-than-significant** level.

5. Near-Term Traffic Conditions

The near-term scenario reflects existing traffic counts plus traffic from approved and pending developments that are expected to be completed and occupied around the same time as the project is completed. Near-term conditions without and with the project are evaluated. The analysis of cumulative conditions is presented in Chapter 6.

Near-Term Forecasts

Information related to approved and pending projects in the study area in Contra Costa County, City of Pleasant Hill, City of Walnut Creek and City of Concord was reviewed based on published information (City of Walnut Creek and City of Concord) and conversations with agency staff (City of Pleasant Hill and Contra Costa County). Copies of these reports are provided in **Appendix F**. Developments that could generate additional traffic through the study area are summarized in **Table 8** and their locations shown on **Figure 10**.

Near-Term project vehicle trip generation was estimated using trip generation rates and equations for the proposed land uses from ITE's *Trip Generation Manual* (10th Edition). The results are provided in **Appendix F**. Traffic generated by approved and pending developments was added to the existing traffic volumes to provide the basis for the Near-Term without Project analysis, as presented on **Figure 11**. The existing traffic counts were also increased by 2.5 percent to account for traffic growth from projects outside the immediate study area that could add through traffic to the area based on growth rates derived from the CCTA model. Project traffic volumes from **Figure 8** were added to the Near-Term without Project forecasts to estimate Near-Term with Project volumes at the study intersections, as presented on **Figure 12**.

Near-Term Roadway Assumptions

Construction of bicycle lanes is planned along the Treat Boulevard corridor to improve overall bicycle connectivity in the area. To accommodate this change, elimination of one eastbound through lane is proposed from the I-680 northbound off-ramp to Jones Road. Assumed intersection configurations are shown on Figure 11 and Figure 12.

Table 8: Approved Projects Summary

Map Location	Project Information
1	Cambria Hotel at the intersection Oak Park Boulevard at Main Street (155 Guest Rooms) (Pleasant Hill)
2	Day Care center at the intersection of Boyd Road at Kahrs Avenue (72 Students) (Pleasant Hill)
3	Fountainhead Day Care Center on Oak Park Boulevard (72 Students) (Pleasant Hill)
4	Development of Housing Element Opportunity sites on Beatrice Road and Cleaveland Road (200 multi-family housing units) (Pleasant Hill)
5	Monticello Specific Plan on Oak Park Boulevard at Monticello Avenue (library relocation, 34 single-family homes, 7 accessory units, 2 sports fields) (Pleasant Hill)
6	85 Cleaveland 221 Multi-family housing units (Pleasant Hill)
7	200 residential units and 2,315 sq. ft. of retail are under construction on block bound by Coggins Dr, Jones Road, HaRvey Drive and Sunne Lane (Contra Costa County)
8	290,000 square foot office building on block bound by Wayne Drive, Oak Road and BART tracks (Contra Costa County)
9	50 multi-family units at 1250 Las Juntas (Walnut Creek)
10	29,000 square-foot auto dealership and 1,360 carwash/detail building at 2791 North Main Street (Walnut Creek)

Source: *City of Walnut Creek Project Pipeline List*, December 31, 2018, *City of Concord Current Projects Report*, September through December 2018, City of Pleasant Hill and Contra Costa County.

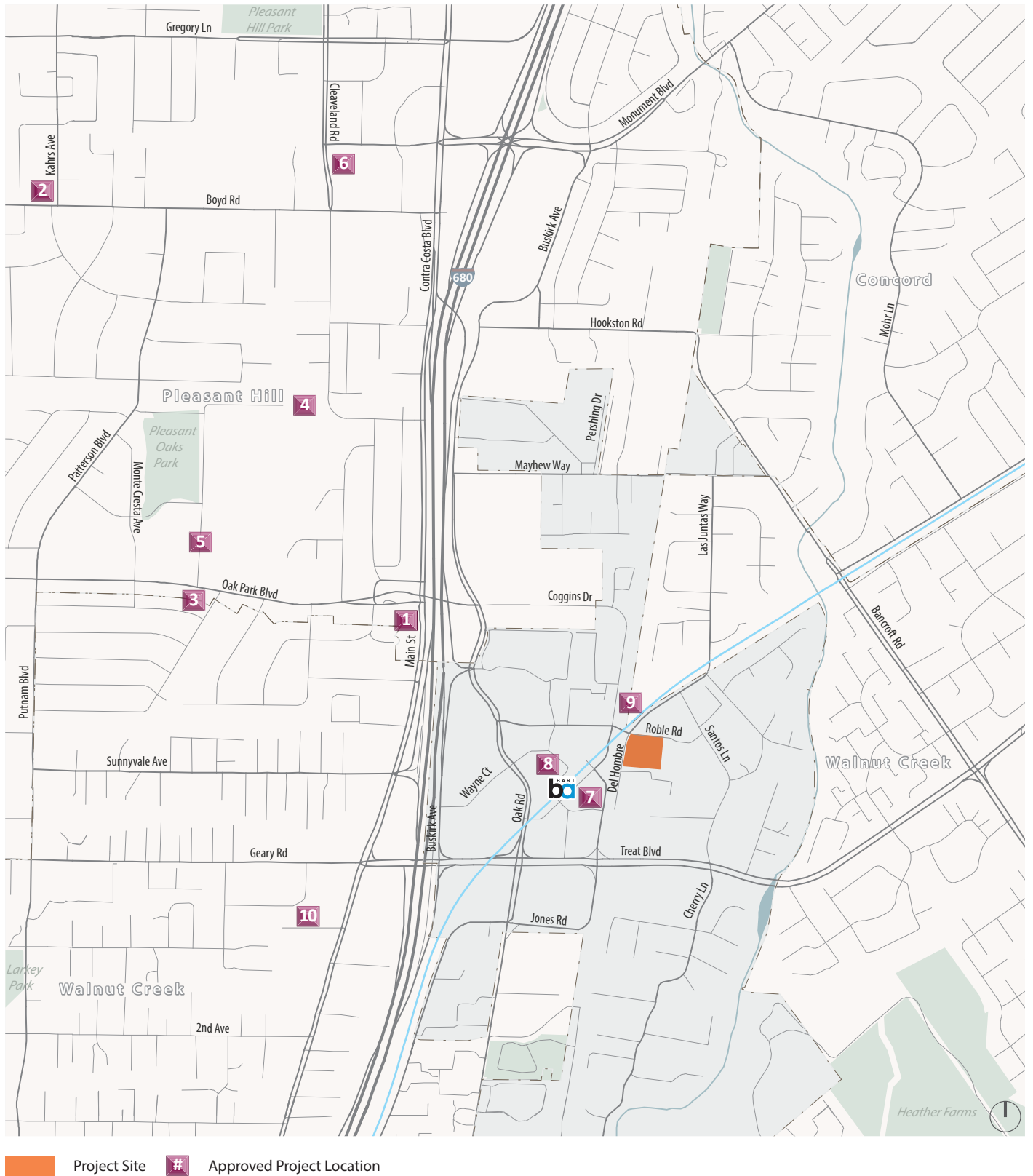
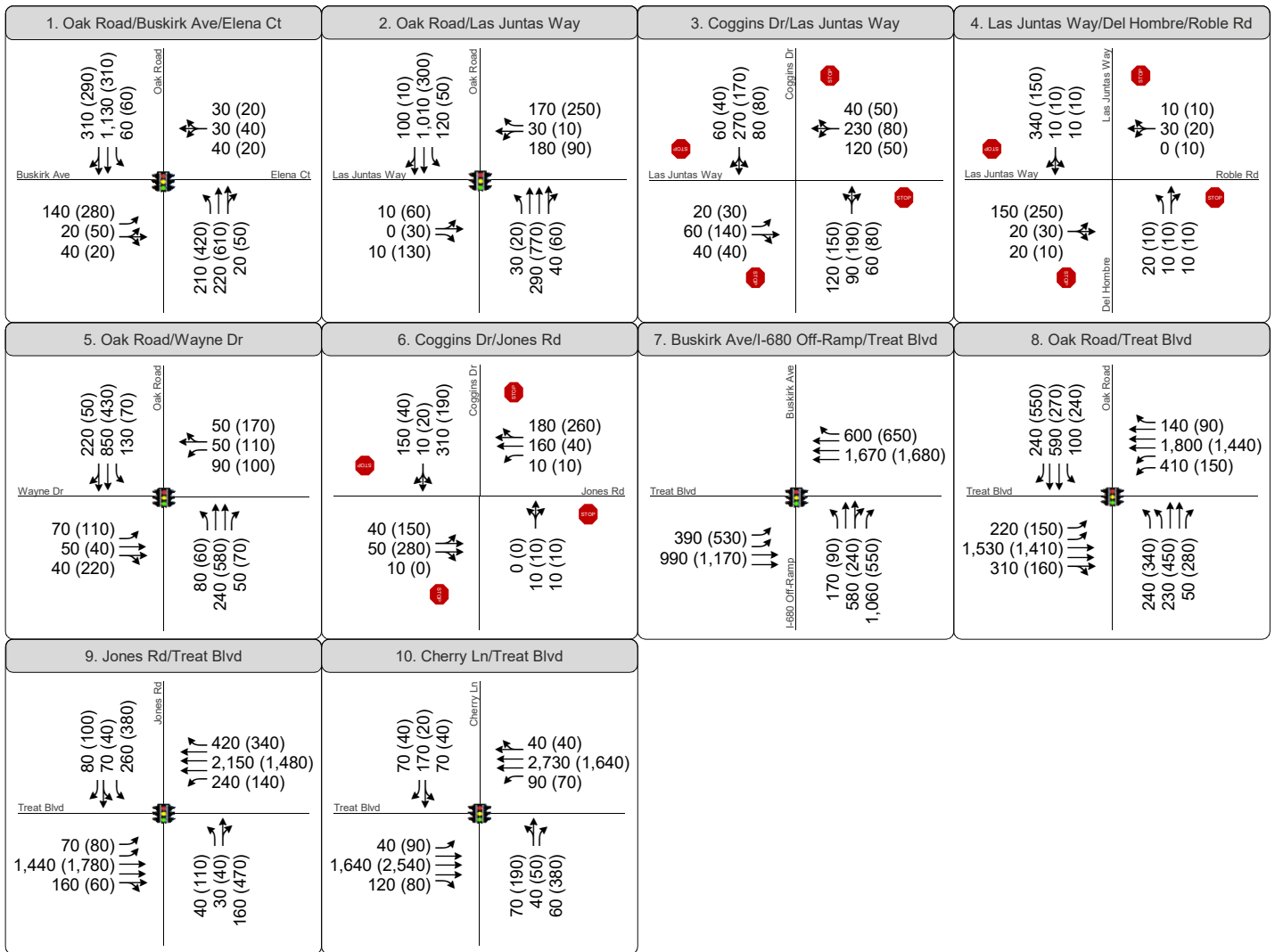
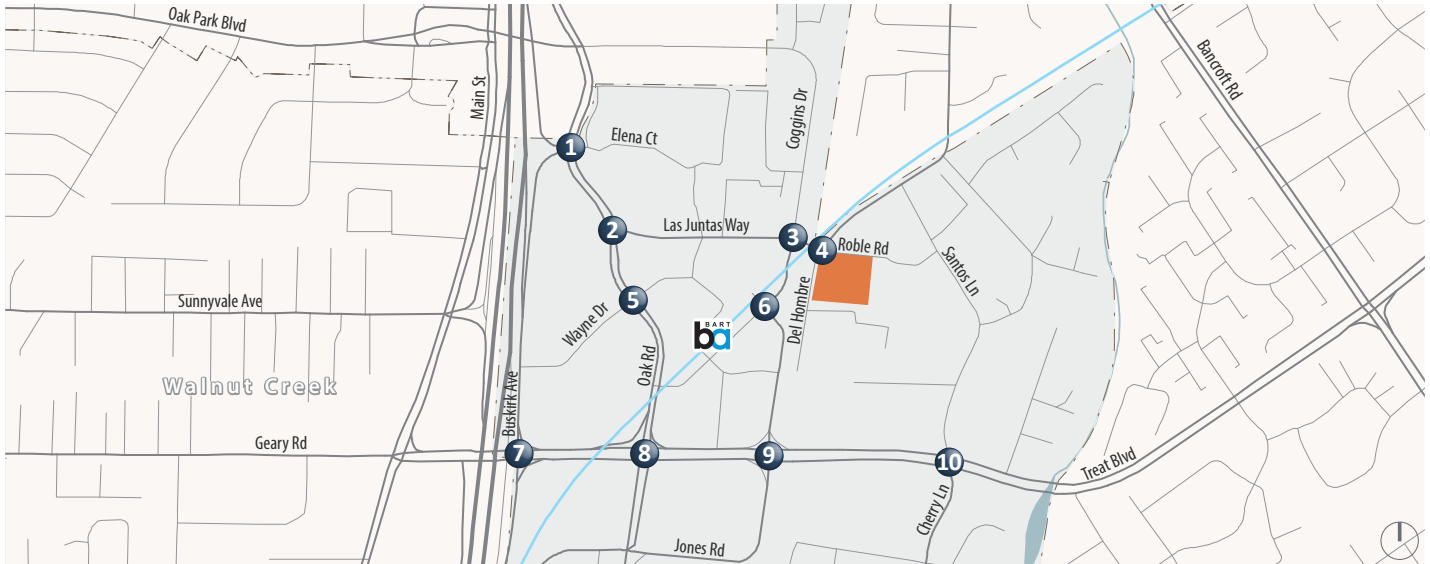


Figure 10

Approved and Pending Project Locations



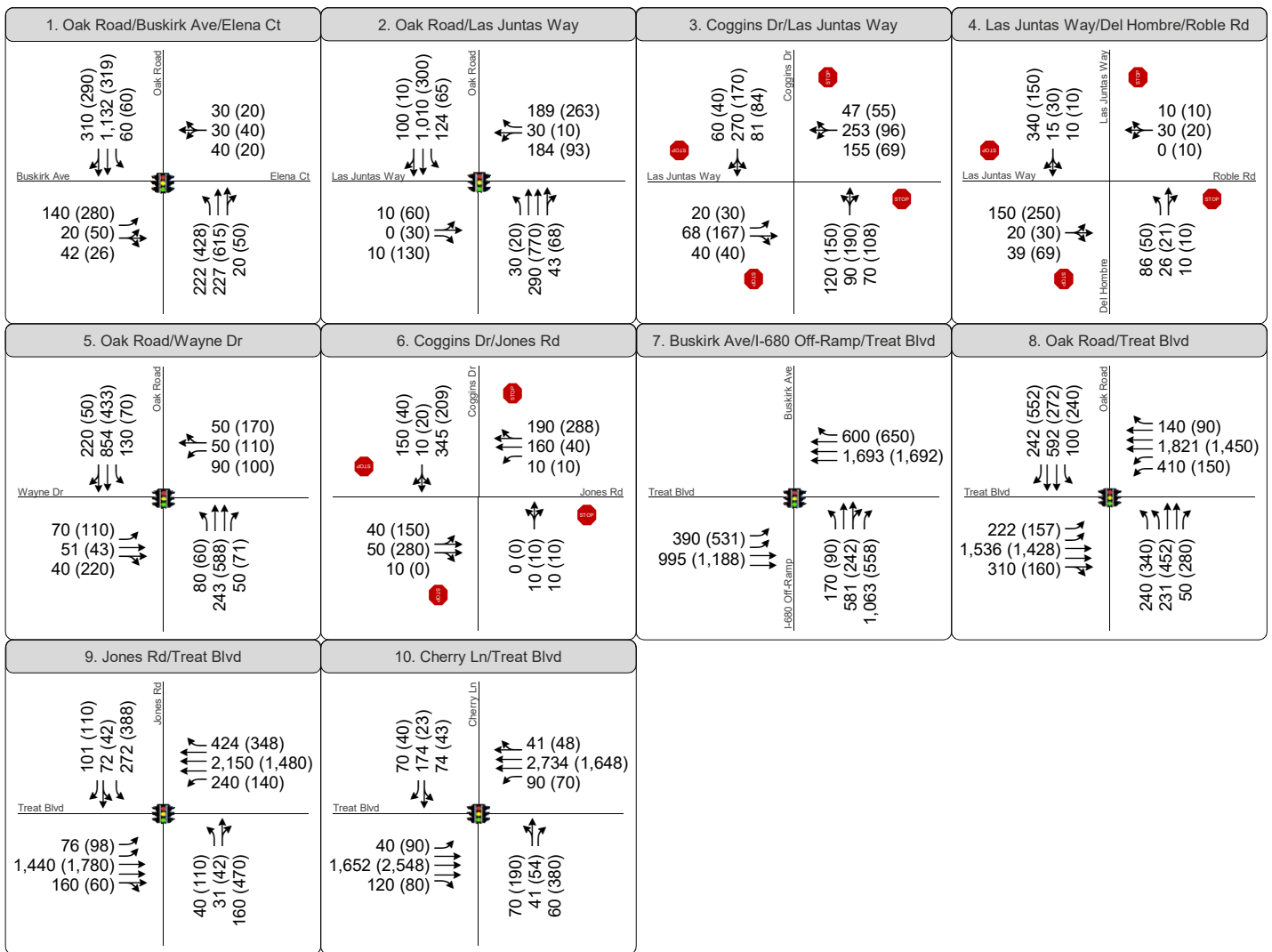
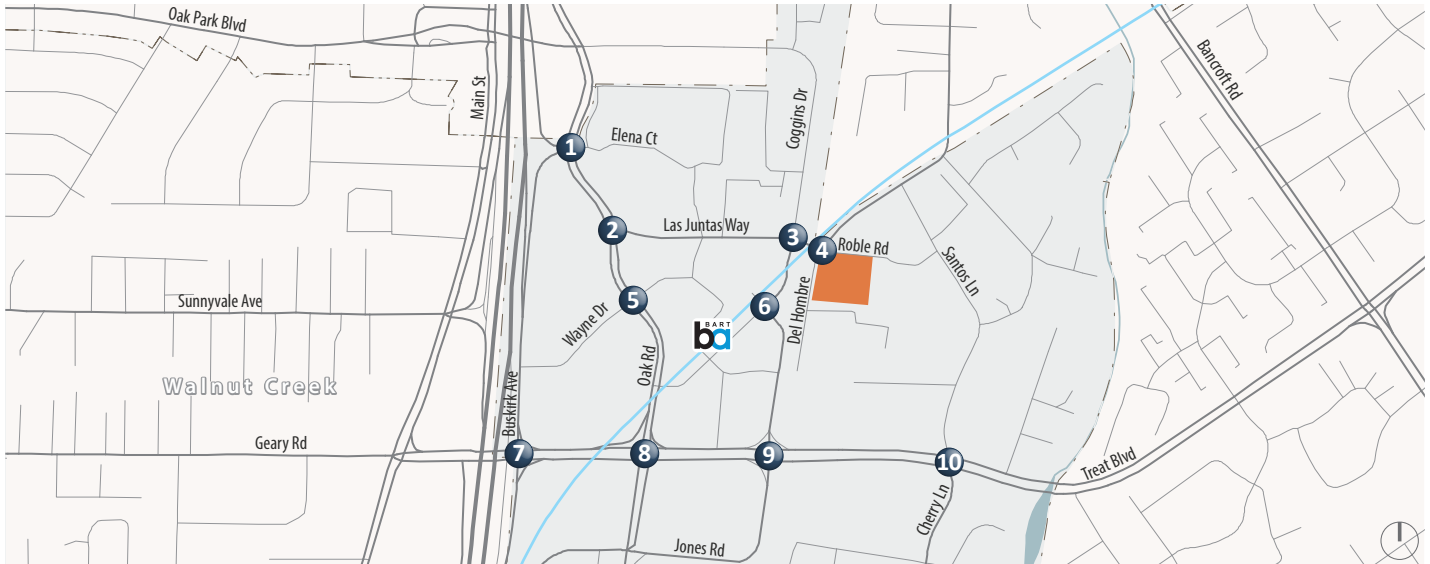
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection



Figure 11

Near-Term without Project Peak Hour Traffic Volumes, Lane Configurations and Traffic Controls



XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection



WC18-3552_X_Volumes

Figure 12

Near-Term with Project Peak Hour
Traffic Volumes, Lane Configurations and Traffic Controls

Analysis of Near-Term Conditions

Near-Term without and with Project conditions were evaluated using the same methods described in Chapter 1. The analysis results are presented in **Table 9**, based on the traffic volumes and lane configurations presented on Figure 11 and Figure 12. In the near-term condition, the Coggins Drive at Las Juntas Way intersection is projected to degrade to LOS E in the morning peak hour. The addition of project traffic would worsen operations and result in the satisfaction of peak hour signal warrants. All other study intersections would operate within designated standards prior to the addition of project traffic, and would continue to operate within designated standards with the addition of project traffic.

Table 9: Near-Term Conditions - Peak Hour Intersection Levels of Service

Intersection	Control ¹	Peak Hour	Near-term without Project Condition		Near-term with Project Condition			
			Delay ³	LOS	Delay ³	LOS	Signal Warrant Met?	Impact?
1 Oak Road at 680 on-ramp and Buskirk Avenue	Signalized	AM PM	36 28	D C	37 29	D C	N/A N/A	No No
2 Oak Road at Las Juntas Way	Signalized	AM PM	9 9	A A	9 9	A A	N/A N/A	No No
3 Coggins Drive at Las Juntas Way	AWSC	AM PM	40 22	E C	60 34	F D	Yes No	Yes No
4 Del Hombre Lane at Roble Road	AWSC	AM PM	11 10	B A	11 11	B B	No No	No No
5 Oak Road at Wayne Drive	Signalized	AM PM	27 23	C C	27 24	C C	N/A N/A	No No
6 Coggins Drive at Jones Road	AWSC	AM PM	25 16	C C	32 18	D C	No No	No No
7 Treat Boulevard at Buskirk Avenue ²	Signalized	AM PM	34 25	C C	34 25	C C	N/A N/A	No No
8 Treat Boulevard at Oak Road ²	Signalized	AM PM	51 57 (0.91)	D E	51 57 (0.92)	D E	N/A N/A	No No
9 Treat Boulevard at Jones Road ²	Signalized	AM PM	50 70 (0.94)	D E	52 72 (0.95)	D E	N/A N/A	No No
10 Treat Boulevard at Cherry Lane ²	Signalized	AM PM	114 (0.89) 151 (0.86)	F F	126 (0.90) 156 (0.86)	F F	N/A N/A	No No

Notes: **Bold** indicates operations below the intersection LOS standard for acceptable operations.

1. AWSC = All-way Stop Controlled; signalized = traffic signal control
2. Volume-to-Capacity ratio shown in parenthesis when LOS value is E or F.
3. Delay shown in seconds.

Source: Fehr & Peers, 2019.

Vehicle Queues

Vehicle queues were assessed for the signalized intersections in the near-term condition, and the addition of project traffic is not expected to result in vehicle queues to increase by more than 50-feet (or 2 car-lengths) for movements where the 95th percentile queue is already exceeded, as presented in **Table 10**. Queue worksheets are provided in **Appendix C**.

Table 10: Near-term Conditions – 95th Percentile Queue Summary

Intersection	Move ment	Storage Length (ft) ¹	AM Peak Period		PM Peak Period	
			Without Project	With Project	Without Project	With Project
1. Oak Road at 680 on-ramp and Buskirk Avenue	EBL	170	200	200	250	250
	NBL	150	325	350	675	700
	SBL	130	125	125	125	125
2. Oak Road at Las Juntas Way	EBR	170	25	25	50	50
	WBR	110	75	75	75	75
	NBL	150	75	75	50	50
	SBL	170	175	200	100	125
5. Oak Road at Wayne Drive	EBL	260	100	100	150	150
	WBL	220	125	125	125	125
	NBL	240	125	125	100	100
	NBR	240	25	25	50	50
	SBL	190	175	175	100	100
7. I-680 Off- Ramp/Treat Boulevard	EBL	275	275	275	400	400
	NBL	300	250	250	150	150
	NBR	1,200	850	875	300	325
8. Treat Boulevard at Oak Road	EBL	150	125	125	125	125
	WBL	240	225	225	125	125
	WBR	320	75	75	50	50
	NBL	260	175	175	275	275
	NBR	240	25	25	100	100
	SBL	275	175	175	500	500
	SBR	120	175	175	775	775
9. Treat Boulevard at Jones Road	EBL	380	50	50	75	75
	WBL	200	450	450	225	225
	WBR	350	350	350	200	200

Table 10: Near-term Conditions – 95th Percentile Queue Summary

Intersection	Move ment	Storage Length (ft) ¹	AM Peak Period		PM Peak Period	
			Without Project	With Project	Without Project	With Project
10. Treat Boulevard at Cherry Lane	NBL	370	75	75	175	175
	SBL	240	230	240	300	325
	SBR	370	25	50	50	75
	EBL	190	100	100	250	250
	EBR	275	50	50	50	50
	WBL	180	250	250	200	200
	NBR	110	50	50	550	550
	SBR	70	75	75	50	50

Notes: **Bold** indicates queue potentially extends beyond available storage.

Bold Italics indicates potentially significant impact.

-- = intersection was not evaluated for this time period.

1. An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

Signal Warrants

Signal warrants were evaluated for the unsignalized intersections and as shown in Table 9, the intersection of Coggins Drive at Las Juntas Way is projected to meet the peak hour signal warrant with the addition of project traffic during the morning peak hour. Signal warrant worksheets are provided in **Appendix D**.

Near-Term Conditions Impacts and Mitigation

One potential off-site intersection impact was identified in the near-term condition.

Impact Statement 2: Intersection 3 – Coggins Drive at Las Juntas Way

The Coggins Drive at Las Juntas Way intersection is projected to operate at an overall unacceptable service level in the morning peak hour in the near-term condition. The addition of project traffic would worsen operations resulting in LOS F conditions in the morning peak hour, and would result in peak hour signal warrants being satisfied. Based on the significance criteria, this is a significant impact.



Mitigation Measure 2: Several improvements were evaluated for this intersection. Signalization of the intersection would worsen the level of service for vehicles as the intersection configuration would require split phasing.

Restricting parking on the north side of Las Juntas Way between Coggins Drive and Del Hombre Lane could allow restriping within the existing right-of-way to provide a left-turn pocket and a through-right shared lane. This improvement would result in LOS D operations (31 seconds) for vehicles during the AM peak hour, reducing the vehicle impact to a less-than-significant level. This improvement would require the removal of 4 to 5 parking spaces that may need to be replaced elsewhere in the project vicinity.

Although this improvement would not increase the intersection crossing distance for bicycles and pedestrians, it could increase vehicle/bicycle/pedestrian conflicts with the provision of an additional vehicle travel lane. As the Iron Horse Trail crosses this intersection and there are high levels of pedestrian and bicycle activity, this would be a secondary impact of restriping to provide an additional vehicle lane.

Including this left-turn pocket would conflict with General Plan Policy 5-18, which directs the County to prioritize intermodal safety over capacity. Therefore, this left-turn pocket would not be included as part of the project and this intersection would continue to operate at unacceptable levels in the morning and evening peak-hour under Cumulative Year with Project Conditions. Therefore, LOS impacts with respect to Cumulative Year with Project at Coggins Drive at Las Juntas Way intersection (Intersection No. 3) would be **significant and unavoidable**.

Although the impact would remain significant and unavoidable for vehicles, the project would increase vehicle trips through the intersection. To minimize the potential for increased vehicle/bicycle/pedestrian conflicts, enhanced crossing treatments should also be installed at the intersection, which could include advance stop bars to maximize visibility, improved crosswalk lighting, and/or a pedestrian/bicyclist actuated trail crossing warning device.

6. Cumulative Conditions

This chapter presents the results of the level of service calculations under cumulative conditions without and with the project.

Cumulative Intersection Volumes and Roadway Improvements

Cumulative forecasts were developed using traffic growth trends as described in the Contra Costa County General Plan and surrounding jurisdictions as documented in the Contra Costa Transportation Authority (CCTA) Countywide Travel Demand Model, as well as considering approved and potential projects in the immediate study area.

Based on growth trends projected by the CCTA model, existing traffic volumes were increased by 11 percent and combined with the vehicle traffic expected to be generated by the approved and pending projects detailed in Chapter 5. Model plots from the travel demand model near the study area are provided in **Appendix E**.

The resulting intersection turning movement forecasts are presented on **Figure 13** for the cumulative without project scenario. Project-only traffic volumes (Figure 8) were added to the cumulative without project peak hour traffic volumes (Figure 13) to estimate Cumulative with Project peak hour intersection turning movement volumes, presented on **Figure 14**. The resulting cumulative forecast are an estimate of conditions in 2040.

The forecasting described above does not take into consideration some foreseeable travel changes, including increased use of transportation network companies, such as Uber and Lyft, nor the potential for autonomous vehicles. Although the technology for autonomous vehicles is expected to be available over the planning horizon, the Federal and State legal and policy frameworks are uncertain. Initial modeling of an autonomous future indicates that with automated and connected vehicles, the capacity of the existing transportation system would increase as vehicles can travel closer together; however, these efficiencies are only realized when a high percentage of vehicles on the roadway are automated and connected. There is also the potential for vehicle travel to increase with zero-occupant vehicles on the roadway, off-setting any potential capacity benefits. Although the future baseline is uncertain, the projects incremental effect on that future baseline is expected to be similar to the analysis results presented below.

No roadway improvements were assumed at any of the study intersections. However, there are a number of projects in the area that could affect regional travel routes, such as the I-680 Northbound and



Southbound High Occupancy Lane Gap Closure Project, improvements to the I-680/SR 4 interchange, improvements to State Route 242, and improvements to the State Route 4 corridor. While these improvements are not expected to appreciably change travel patterns in the area, they are expected to allow more vehicles to stay on the regional roadway system, moderating the pressure on Treat Boulevard and other parallel routes to serve increased levels of regional through traffic.

Analysis of Cumulative Conditions

Intersection Level of Service

Existing peak hour factors, heavy vehicle percentages, and pedestrian and bicycle activity at the study intersections remain unchanged from the existing condition for the assessment of Cumulative conditions.

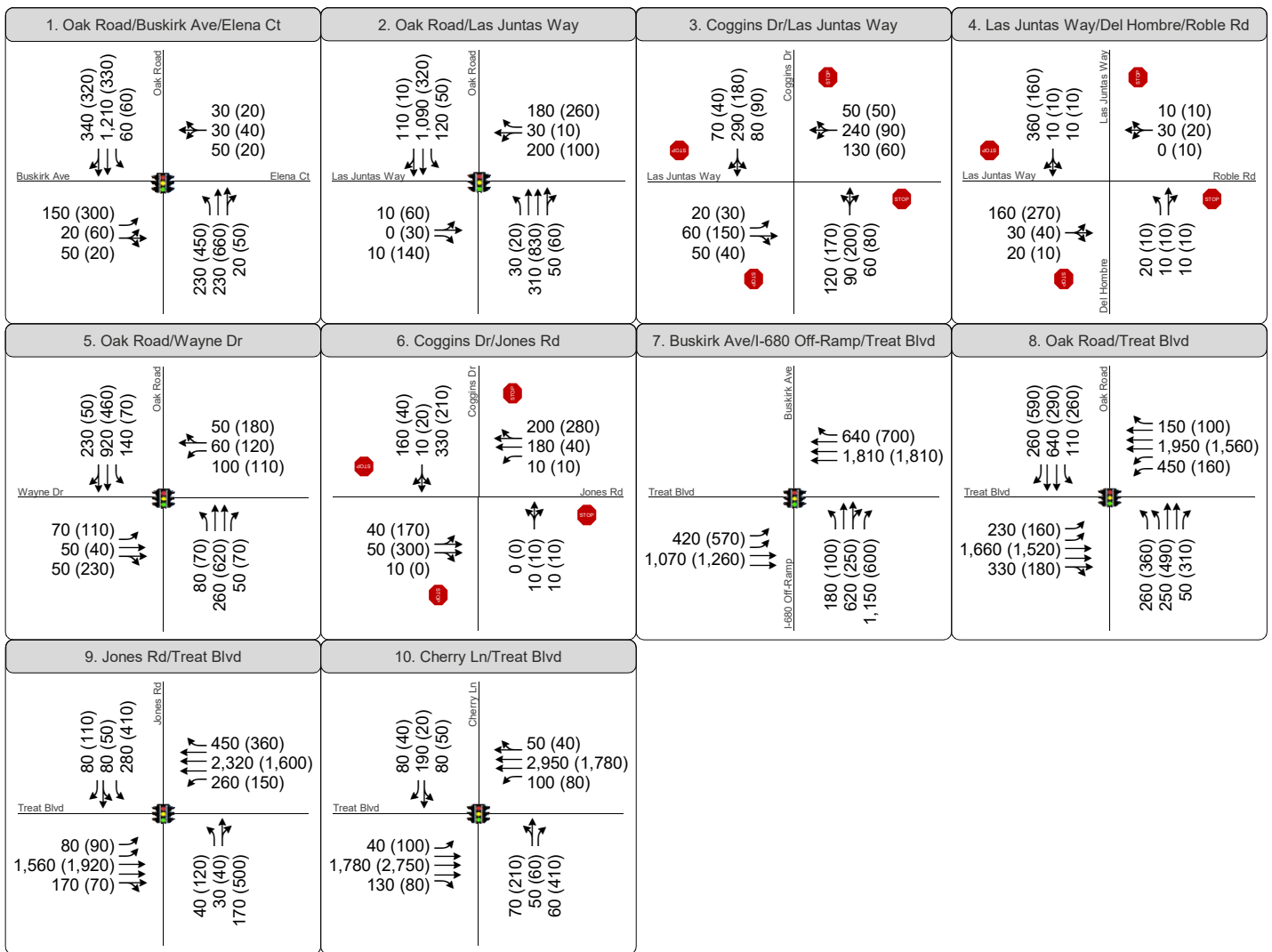
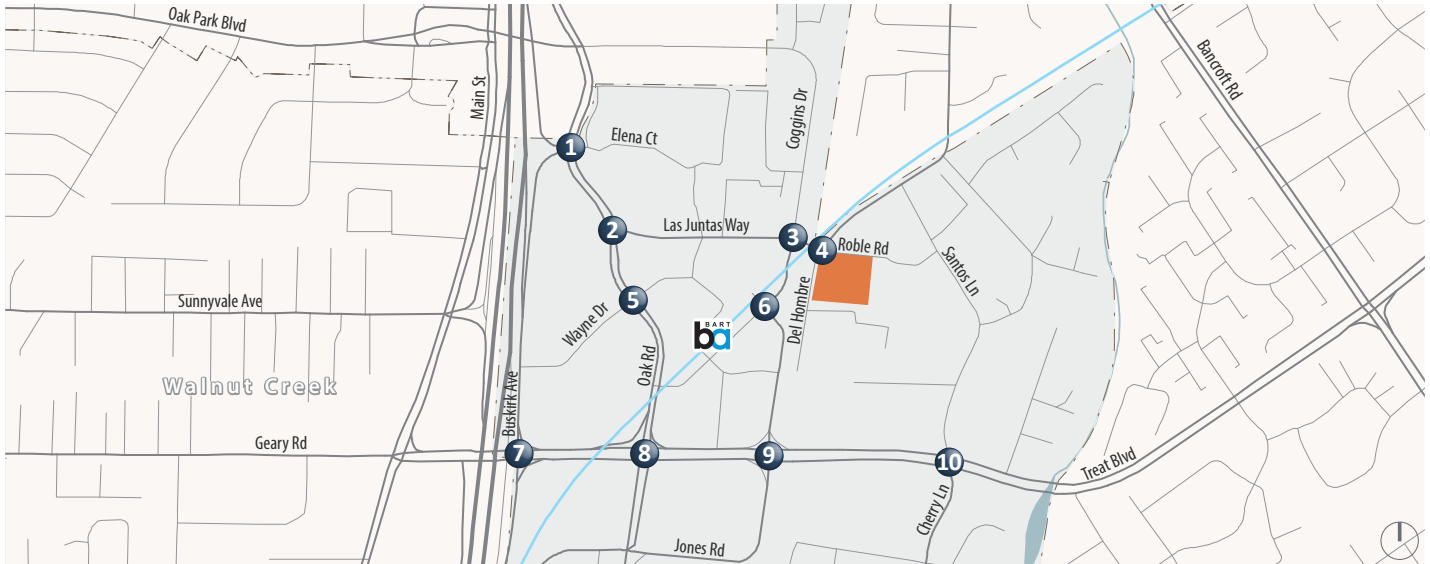
Traffic signal timings were optimized at intersections where the initial analysis indicated LOS E or F operations, reflecting that as part of Contra Costa County's continuing maintenance of traffic signals, signal timing for intersections near capacity are regularly updated to better accommodate actual travel demand.

Table 11 presents the Cumulative without and with Project intersection level of service results.

In the cumulative condition, the Coggins Drive at Las Juntas Way intersection is projected to degrade to LOS F in the morning peak hour prior to the addition of project traffic. The addition of project traffic would worsen operations in the morning peak hour and result in LOS E conditions in the PM peak hour. Peak hour signal warrants would be satisfied in the morning peak hour prior to the addition of project traffic. This is a potentially significant impact during the morning peak hour as the project would increase delay by more than 5-seconds and peak hour signal warrants are met.

The Coggins Drive at Jones Road intersection is projected to operate at an acceptable service level prior to the addition of project traffic, and the addition of project traffic would result in overall LOS E operations. Peak hour signal warrants are not satisfied in the cumulative condition even with the addition of project traffic. Therefore, this impact is considered less-than-significant.

All other study intersection would operate within designated standards prior to the addition of project traffic, and would continue to operate within designated standards with the addition of project traffic. Detailed intersection LOS calculation worksheets are provided in **Appendix C**.



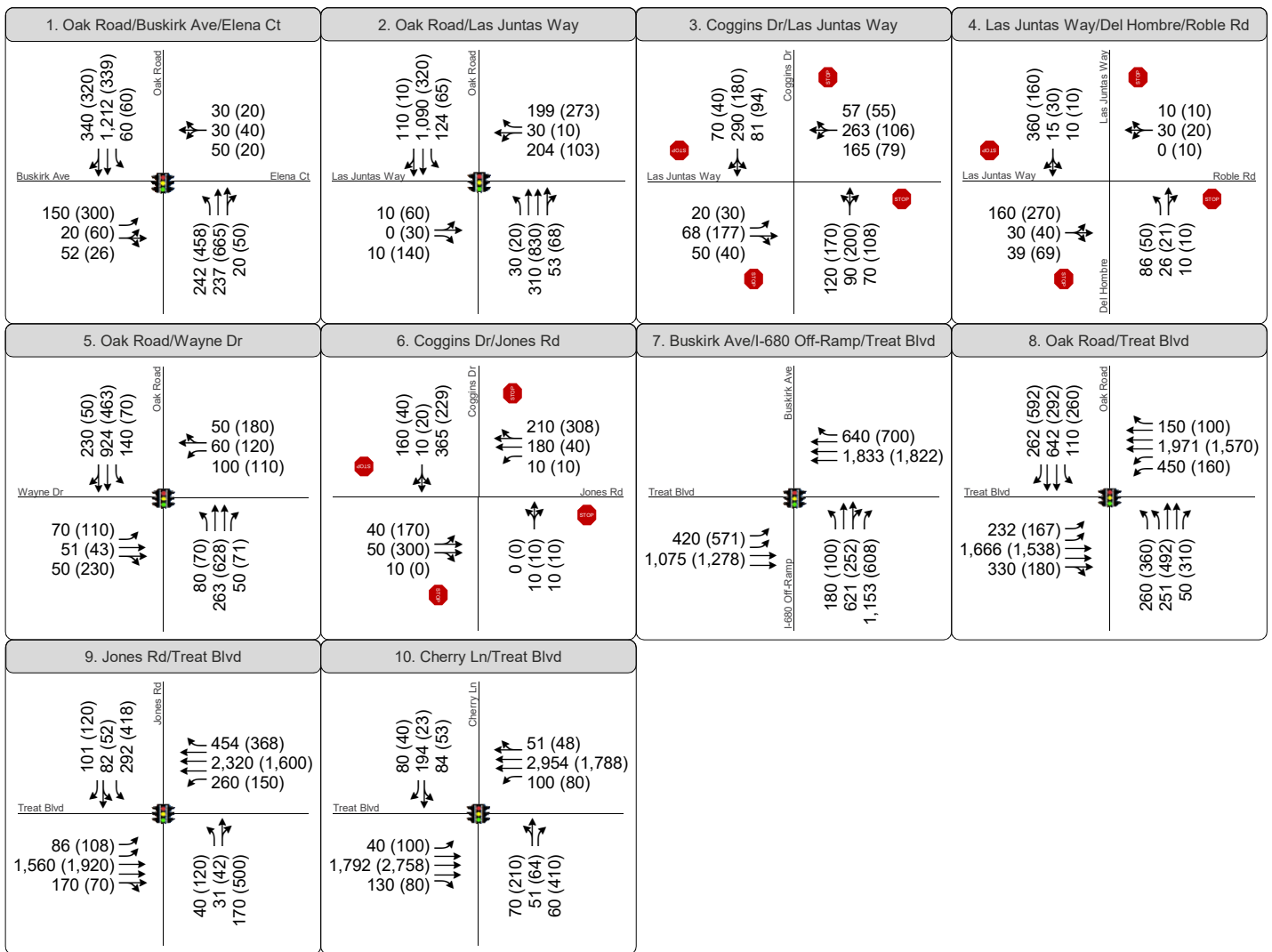
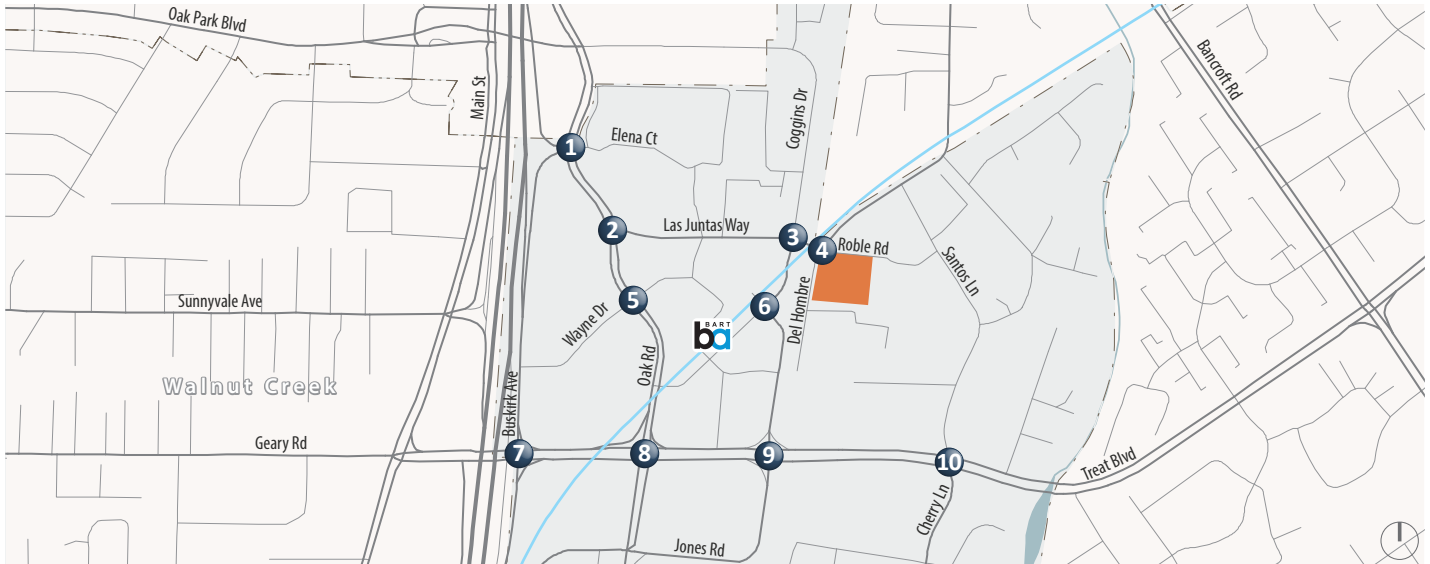
XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection



Figure 13

Cumulative without Project Peak Hour Traffic Volumes, Lane Configurations and Traffic Controls



XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection



WC18-3552_X_Volumes

Figure 14

Cumulative with Project Peak Hour
Traffic Volumes, Lane Configurations and Traffic Controls

Table 11: Cumulative Conditions - Peak Hour Intersection Levels of Service

Intersection	Control ¹	Peak Hour	Cumulative Conditions		Cumulative Plus Project Conditions			
			Delay ³	LOS	Delay ³	LOS	Signal Warrant Met?	Impact?
1 Oak Road at 680 on-ramp and Buskirk Avenue	Signalized	AM PM	49 33	D C	51 34	D C	N/A N/A	No No
2 Oak Road at Las Juntas Way	Signalized	AM PM	9 8	A A	10 9	A A	N/A N/A	No No
3 Coggins Drive at Las Juntas Way	AWSC	AM PM	56 32	F D	78 50	F E	Yes No	Yes No
4 Del Hombre Lane at Roble Road	AWSC	AM PM	11 11	B B	12 12	B B	No No	No No
5 Oak Road at Wayne Drive	Signalized	AM PM	30 25	C C	30 25	C C	N/A N/A	No No
6 Coggins Drive at Jones Road	AWSC	AM PM	32 19	D C	43 21	E C	No No	No No
7 Treat Boulevard at Buskirk Avenue ²	Signalized	AM PM	45 38	D D	45 38	D D	N/A N/A	No No
8 Treat Boulevard at Oak Road ²	Signalized	AM PM	56 (0.93) 62 (1.03)	E E	56 (0.93) 64 (1.04)	E E	N/A N/A	No No
9 Treat Boulevard at Jones Road ²	Signalized	AM PM	32 83 (1.09)	C F	33 84 (1.10)	C F	N/A N/A	No No
10 Treat Boulevard at Cherry Lane ²	Signalized	AM PM	126 (0.94) 155 (0.93)	F F	138 (0.94) 160 (0.93)	F F	N/A N/A	No No

Notes: **Bold** indicates operations below the intersection LOS standard for acceptable operations.

1. AWSC = All-way Stop Controlled; signalized = traffic signal control
2. Volume-to-Capacity ratio shown in parenthesis when LOS value is E or F.
3. Delay shown in seconds.

Source: Fehr & Peers, 2019.

Vehicle Queues

Vehicle queues were assessed for the signalized intersections in the near-term condition, and the addition of project traffic is not expected to result in vehicle queues to increase by more than 50-feet (or 2 car-lengths) for movements where the 95th percentile queue is already exceeded, as presented in **Table 12**. Queue worksheets are provided in **Appendix C**.

Table 12: Cumulative Conditions – 95th Percentile Queue Summary

Intersection	Move ment	Storage Length (ft) ¹	AM Peak Period		PM Peak Period	
			Without Project	With Project	Without Project	With Project
1. Oak Road at 680 on-ramp and Buskirk Avenue	EBL	170	200	200	275	300
	NBL	150	450	475	775	825
	SBL	130	125	125	125	125
2. Oak Road at Las Juntas Way	EBR	170	25	25	50	50
	WBR	110	75	75	75	75
	NBL	150	75	75	50	50
	SBL	170	175	200	100	125
5. Oak Road at Wayne Drive	EBL	260	100	100	150	150
	WBL	220	125	125	150	150
	NBL	240	125	125	100	100
	NBR	240	25	25	50	50
	SBL	190	175	175	100	100
7. I-680 Off- Ramp/Treat Boulevard	EBL	275	270	275	450	450
	NBL	300	150	125	150	150
	NBR	1,200	675	600	375	400
8. Treat Boulevard at Oak Road	EBL	150	175	200	150	150
	WBL	240	375	375	150	150
	WBR	320	75	75	50	50
	NBL	260	250	250	250	250
	NBR	240	25	25	225	225
	SBL	275	200	200	375	375
	SBR	120	200	200	625	625
9. Treat Boulevard at Jones Road	EBL	380	75	100	100	125
	WBL	200	350	350	375	375
	WBR	350	175	175	225	225
	NBL	370	75	75	175	175
	SBL	240	250	275	325	350
	SBR	370	25	50	75	75
10. Treat Boulevard at Cherry Lane	EBL	190	50	50	150	150
	EBR	275	25	25	50	50
	WBL	180	175	175	180	200
	NBR	110	25	25	400	400

Table 12: Cumulative Conditions – 95th Percentile Queue Summary

Intersection	Move ment	Storage Length (ft) ¹	AM Peak Period		PM Peak Period	
			Without Project	With Project	Without Project	With Project
	SBR	70	50	50	25	25

Notes: **Bold** indicates queue potentially extends beyond available storage.

Bold Italics indicates potentially significant impact.

-- = intersection was not evaluated for this time period.

1. An additional 60 to 90 feet of storage is typically provided in the taper area outside of the through lane, which is not reflected in the storage length above.

Signal Warrants

Signal warrants were evaluated for the unsignalized intersection where LOS E or LOS F conditions are perfected. As shown in Table 11, the Coggins Drive at Las Juntas Way intersection is projected to meet peak hour signal warrants in the cumulative condition prior to the addition of project traffic. Signal warrant worksheets are provided in **Appendix D**.

Cumulative Conditions Impacts and Mitigation

One potential off-site intersection impact was identified in the cumulative condition.

Impact Statement 3: Intersection 3 – Coggins Drive at Las Juntas Way

The Coggins Drive at Las Juntas Way intersection is projected to operate at an overall unacceptable service level in the morning peak hour in the near-term condition. The addition of project traffic would worsen operations resulting in LOS F conditions in the AM peak hour and result in LOS E conditions during the PM peak hour. Peak hour signal warrants are satisfied in the AM peak hour prior to the addition of project traffic, but not in the PM peak hour. Based on the significance criteria, this is a significant impact during the morning peak hour.

Mitigation Measure 3: Implement Mitigation Measure 2.

Restricting parking on the north side of Las Juntas Way between Coggins Drive and Del Hombre Lane could allow restriping within the existing right-of-way to provide a left-turn pocket and a through-right shared lane. This improvement would result in LOS E operations (41 seconds) for

vehicles during the morning peak hour, reducing the vehicle impact to a less-than-significant level as it would improve operations to conditions better than the without project condition during the morning peak hour. This improvement would require the removal of 4 to 5 parking spaces that may need to be replaced elsewhere in the project vicinity.

Although this improvement would not increase the intersection crossing distance for bicycles and pedestrians, it could increase vehicle/bicycle/pedestrian conflicts with the provision of an additional vehicle travel lane. As the Iron Horse Trail crosses this intersection and there are high levels of pedestrian and bicycle activity, this would be a secondary impact of restriping to provide an additional vehicle lane.

Including this left-turn pocket would conflict with General Plan Policy 5-18, which directs the County to prioritize intermodal safety over capacity. Therefore, this left-turn pocket would not be included as part of the project and this intersection would continue to operate at unacceptable levels in the morning and evening peak-hour under Cumulative Year with Project Conditions. Therefore, LOS impacts with respect to Cumulative Year with Project at Coggins Drive at Las Juntas Way intersection (Intersection No. 3) would be ***significant and unavoidable***.

Although the impact would remain significant and unavoidable for vehicles, the project would increase vehicle trips through the intersection. To minimize the potential for increased vehicle/bicycle/pedestrian conflicts, enhanced crossing treatments should also be installed at the intersection, which could include advance stop bars to maximize visibility, improved crosswalk lighting, and/or a pedestrian/bicyclist actuated trail crossing warning device.



7. Site Access, Circulation & Parking

This section is based on the site plan dated November 1, 2018 as presented previously on Figure 2. Considerations for all modes of travel as well as parking are provided. Site plan recommendations are summarized on **Figure 15**.

Site Access and Circulation

Vehicular Access

Vehicular access to the project site would be provided by a new driveway on Del Hombre Lane that would provide access to the proposed parking garage. Based on the existing traffic volumes on Del Hombre Lane and the projected project volumes, this roadway is projected to operate with minimal delay for vehicles.

Access to a loading area with access to the trash room is proposed from Roble Road. It is unclear if this loading area would be used for general deliveries to the site, or only for refuse collection.

Recommendation 1: Provide details related to the pedestrian path of travel from residential units to the refuse collection areas.

If the trash collection area is proposed to be co-located with more general loading needs of the building, trash pick-up times should be set for early morning with provisions for site staff to return refuse bins to the collection room prior to 6 AM.

Recommendation 2: Identify where delivery/moving vehicles would stage for typical daily operation (such as UPS deliveries) and resident move-in/move-out procedures.

It is expected that some vehicle trips to the site may be made through the use of transportation network companies such as UBER or Lyft. It is unclear from the site plan if a designated passenger loading area has been identified that reduces the potential for vehicle travel through the neighboring private streets.

Recommendation 3: Identify passenger loading areas. Consider designating a parking spaces within the parking garage for passenger loading.

Del Hombre Lane would be widened along the project frontage to provide two 12-foot travel lanes and an 8-foot parking lane. At the approach to Las Juntas Way, the existing parking lane would be eliminated to accommodate a northbound left-turn pocket. Improvements would also be made on Roble Road to provide a sidewalk. Existing on-street parking would be maintained.



1. Identify pedestrian path of travel to refuse collection areas.
2. Identify where delivery/moving vehicles would stage for typical daily operation (such as UPS deliveries) and resident move-in/move-out procedures.
3. Identify passenger loading areas. Consider designating a parking 9. spaces within the parking garage for passenger loading.
4. Relocate the crosswalk on the west side of Del Hombre Lane to align with the curb ramp on the southern edge of the property, or mark a diagonal crosswalk.
5. Provide additional details related to the street lighting along the project frontages to provide a lit pedestrian path of travel along the project frontage, connecting to the Iron Horse Trail.
6. Prepare a parking management plan.
7. Review design of EV spaces to ensure compliance with County Requirements.
8. Identify the location of long-term bicycle parking supplies and identify the path of travel from the public right-of-way to the bicycle storage facilities that minimizes conflicts with vehicle and pedestrian routes.
9. Identify a designed shared mobility hub where shared bicycles and scooters could be staged outside of main pedestrian travel routes.
10. Provide additional details regarding the proposed bicycle rack systems within the bicycle storage room(s) to confirm the proposed supply.
11. Confirm that all parking stalls adjacent to walls allow for passenger maneuvers out of vehicles, and vehicle maneuvers into/out of stalls.
12. Provide additional details related to the garage ramping system.

Figure 15

Conceptual Site Plan Recommendations

Pedestrian Facilities

The conceptual project site plan shows pedestrian facilities along both sides of the project frontage on Del Hombre Lane, Roble Road, and along Honey Trail. The pedestrian path along Honey Trail would be separated from the adjacent development by a fence. The sidewalk on Del Hombre Lane is proposed to be 10.7 feet south of the parking garage access, and 8 feet north of the garage access. The sidewalk on Roble Road is proposed to be 8-feet. A new crosswalk is also proposed on the south leg of Del Hombre Road at Las Juntas Way/Roble Road in addition to reconstructed curb ramps on the southeast corner of the intersection. On the southern end of the project site, a new curb ramp would be constructed on Del Hombre Lane, off-set from the existing curb ramp on the west side of the street connecting to the Iron Horse Trail.

Recommendation 4: Relocate the curb ramp on the west side of Del Hombre Lane to align with the curb ramp on the southern edge of the property, and install high visibility crossing treatments, including pedestrian scale lighting.

It is not clear from the conceptual plans if street-lighting will be provided along the project frontage.

Recommendation 5: Provide additional details related to the street lighting along the project frontages to provide a lit pedestrian path of travel along the project frontage, connecting to the Iron Horse Trail.

Bicycle Facilities

The project is located in close proximity to the Iron Horse Trail and would improve connections to the trail as part of the pedestrian facility improvements described above.

Transit Accessibility

The project site is located within 500 feet of a BART station which also serves as a bus transit hub. With construction of the pedestrian improvements noted above, there is a direct pedestrian connection from the project site to the BART station and bus stops.

Emergency Vehicles

Several factors determine whether a project has sufficient access for emergency vehicles, including:

1. Location of closest fire stations
2. Number of access points (both public and emergency access only)
3. Width of access points

4. Width of internal roadways

Each of these factors is discussed in further detail below.

The fire station closest to the site is located on 2012 Geary Road (Fire Station 2) approximately 1.5-miles from the project site via Treat Boulevard. Primary access to the project site would occur from existing roadways that would not be changed as part of the project.

Based on the 2016 *California Fire Code* as amended by Contra Costa County Ordinance 2016-23, the minimum number of access roads serving residential development(s) shall be based upon the number of dwelling units served as follows:

- Multiple Family Residential Projects having more than 100 dwelling units should be provided with two separated and approved fire apparatus access roads (D106.1)

Access to the residential project would be provided from a roadway connection to Del Hombre Lane. An additional fire access connection would be provided from Roble Road, providing two points of access to the site from the surrounding street network.

Parking

Although the project site is not located within the Pleasant Hill BART Station Area Specific Plan Area, the project is located approximately 500 feet from a BART station and it is expected that many future residents would self-select to live in this development to take advantage of the proximity to BART and other transit providers. Therefore, parking requirements were developed based on ratios provided in the *Amended Pleasant Hill BART Station Area Specific Plan*, October 6, 1998.

For multi-family residential uses, the minimum parking requirement is 0.75 spaces per sleeping space or 1.0 space per unit, whichever is greater. The maximum number of spaces per project shall not be greater than 1.5 per dwelling unit. As shown in **Table 13**, the project is required to provide a minimum of 324 parking spaces. The maximum amount of parking that could be provided is 426 spaces. The project proposes to provide approximately 380 spaces or an average of 1.34 spaces per unit, which is within the required range.

Table 13: Automobile Parking Requirements

Unit Type	Amount	Requirement	Requirement
Studio	21-units	1.0 per unit	21 spaces
1-bedroom	178-units	1.0 per unit	175 spaces
2-bedrooms	85-units	0.75 per bedroom	128 spaces
Minimum Requirement			324
Maximum Allowed (1.5 spaces per unit)			426
Total Supply			380
Average number of parking spaces per unit			1.34

Source: Amended Pleasant Hill BART Station Area Specific Plan, 1998, Fehr & Peers, 2019.

Of the total parking supply, there are 31-pairs of tandem parking stalls. For multi-family residential projects, up to 15 percent of parking supplies can be provided via tandem parking. The project meets this requirement.

Recommendation 6: Although the project provides sufficient parking to meet parking requirements, approximately 31-pairs of tandem stalls are proposed within the site. Additionally, there are a mixture of compact and standard stalls and vehicles parking oversized vehicles in compact stalls could limit maneuverability into an out of adjacent stalls. It is recommended that the project applicant prepare a draft parking management plan to be reviewed and accepted by the Department of Conservation and Development that considers the following:

1. Unbundle the parking cost from the rent, resulting in residents paying one price for the residential unit and a separate price for parking, should they opt for a space. The cost of parking can be adjusted such that resident parking demand and supply are in equilibrium (see item 4 below).
2. Assign specific parking spaces to tenants who opt to lease a parking space and provide flexible parking space lease terms that allow for termination of the parking space lease during the residential lease term
3. Assign tandem spaces to the same unit
4. Implement variable parking pricing such that each subsequent parking space leased by a unit costs more than the previous space, (i.e., the second parking space is more expensive than the first; the third is more expensive than the second, etc.), and if the percentage of leased parking spaces is higher than the percentage of leased units, the parking price is adjusted until equilibrium is reached. For example, if 90 percent of parking spaces are leased but only 85 percent of units are leased, the monthly cost



of parking should be increased such that new tenants opt to lease parking at a lower rate—higher cost—than existing tenants.

5. Implement restrictions on the use of guest parking spaces, such as: requiring guest vehicles to be registered with the building management; limiting the number of times the same guest vehicle can park overnight within the garage; limiting the number of guest permits a resident can request per month (strategy could increase on-street demand and may need to be monitored for effectiveness).
6. Implement time restrictions on guest parking during daytime hours to minimize the potential for guest parking spaces to be used as BART parking

Contra Costa County requires that at least 5 percent of parking spaces for multi-family developments provide Electric Vehicle (EV) charging systems. They must be designed with accessibility in mind, as detailed in Section 82-16.404(e) of the County's municipal code. Eight EV spaces are identified on the site plan, or approximately 2 percent of the parking supply.

Recommendation 7: Provide EV charging systems for at least 5 percent of the parking supply and review design of EV spaces to ensure compliance with County Requirements. As EV sales are increasing as a proportion of overall vehicle sales, consider identify other areas within the garage where additional EV spaces could be added if future demand from residents dictates.

Bicycle Parking

Contra Costa County requires that for multi-family projects provide long-term bicycle parking at a rate of 15 percent of the number of bedrooms and short-term bicycle parking at 5 percent of the number of bedrooms. Based on a total of 369 bedrooms, 56 long-term bicycle spaces and 19 short-term bicycle parking spaces are required. It is not clear where the short-term and long-term bicycle parking supplies are proposed to be provided.

Recommendation 8: Identify the location of short-term and long-term bicycle parking supplies and identify the path of travel from the public right-of-way to the bicycle storage facilities that minimizes conflicts with vehicle and pedestrian routes.

The increased prevalence of shared mobility services in the area have resulted in the potential for sidewalk blockages and other conflicts between bicyclists, scooters and pedestrians.

Recommendation 9: Identify a designed on-site shared mobility hub where shared bicycles and scooters could be staged outside of main pedestrian travel routes. The design of the hub should safely accommodate the potential vehicular (car/bicycle/scooter) movements associated with such a hub, and prevent spill-over onto public right-of-way.



Design details for the bicycle rack systems are not shown on the plans and it is difficult to confirm the proposed bicycle capacity. Based on information provided in *Bicycle Parking Guidelines, 2nd Edition, A set of Recommendations from the Association of Pedestrian and Bicycle Professionals*, typical bicycles are 72 inches (6 feet) long, with a span of 24 inches (2 feet) at widest point (handlebars), and a height of 48 inches (4 feet). A bicycle storage room using traditional racks should provide 96 inches (72 inch minimum) of distance between the wall and a circulation aisle, in which the rack would be placed. The circulation aisle should be 60 inches wide. The distance between each rack should be 48 inches (30 inch minimum).

Recommendation 10: Provide additional details regarding the proposed bicycle rack systems within the bicycle storage room(s) to confirm the proposed supply.

Consider providing a variety of bicycle storage options, including bicycle lockers, double decked systems that maximize capacity, and traditional bicycle racks.

Bicycle lockers provide the most security and could be appealing to those who have invested heavily into their bicycle, and have bicycle accessories that are at risk for theft. Double decked systems increase capacity, but some users can have difficulties using the rack system. These systems also tend to require more maintenance as they have moving parts. Traditional systems are less space efficient, but are more cost effective, require less maintenance, and are generally easiest for bicyclist to use.

Motorcycle Parking

Section 82-16.404 of the Municipal Code allows parking lots with more than 20-spaces to provide up to 6 motorcycle parking spaces. However, these spaces cannot be counted towards the minimum number of parking spaces. No motorcycle parking is shown on the plan.

Accessible Parking

Accessible parking spaces, as required by the Americans with Disabilities Act (ADA), would also need to be provided within the Project site. The requirement is based on the total number of parking spaces. For parking areas with between 301 and 400 parking spaces, eight ADA accessible stalls are required with a least one stall designed to be van accessible. Eight ADA spaces are shown on the site plan, with at least one available for guests. At least one van accessible space is also shown.

Parking Area Design

Layout of the parking areas was reviewed based on the plan shown on Figure 2. The review was based on design guidelines provided in Section 82.16.404 of the County's Municipal Code.

The main driveway from Del Hombre Lane is proposed to be 25.25 feet wide, which meets the 25-foot drive aisle requirement.

Parking aisle widths, which are proposed to be 24-feet, generally do not conform to the County's requirement of 25-feet wide for perpendicular parking. However, 24-drive aisle meet the typically accepted minimum width for drive aisles. Reducing the length of the compact stalls from the proposed 17-feet to the allowed 16-feet would allow drive aisle widths to be increased.

Standard parking stall lengths generally conform to the County's minimum requirement of 18-feet, with a width of 8.5-feet; compact stalls are slightly larger than the minimum allowed (7.5 feet by 16 feet), as they are proposed to be 7.5 feet by 17 feet. Parking spaces adjacent to walls and pillars generally appear to be slightly larger, however, there are a few locations where maneuverability should be confirmed.

Recommendation 11: Confirm that all parking stalls adjacent to walls allow for passenger maneuvers out of vehicles, and vehicle maneuvers into/out of stalls. Questionable stall locations are shown on Figure 15.

Design details related to the parking garage ramps and landing areas on either end of the ramp are not provided.

Recommendation 12: Provide additional details related to the garage ramping system.

8. Vehicle Miles of Travel

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) updated the California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with updated draft guidelines prepared January 2016, which incorporated public comments from the August 2014 guidelines. OPR released final proposed Guidelines on November 27, 2017. The final proposed Guidelines include a new Section 15064.3 on VMT analysis and thresholds for land use developments. OPR also released a Technical Advisory on Evaluating Transportation Impacts in CEQA. New Guidelines section 15064.3 states that they do not take effect until July 1, 2020 unless the lead agency adopts them earlier. Neither Contra Costa County or Contra Costa Transportation Authority has established any standards or thresholds on VMT. Therefore, the new guidelines have not yet been adopted and are not in effect at this time.

Since there are no standards in effect on VMT analysis, a preliminary assessment of the vehicle miles of travel (VMT) generated by the proposed project was prepared for informational and disclosure purposes only. No determination on the significance of VMT impacts is made in this document since none is legally required.

CEQA Guidelines

Changes to Appendix G of the CEQA guidelines were finalized in January 2019, with methods for evaluating transportation impacts detailed in the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018)⁸ The following provides the information relevant to this project:

Text of Amendments to Appendix G

b) For a land use project, would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1)?

(b) Criteria for Analyzing Transportation Impacts.

(1) Land Use Projects. Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the

⁸ Full document can be found here:
http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

project area compared to existing conditions should be considered to have a less than significant transportation impact.

OPR has established a draft threshold for the evaluation of different land use types. For residential uses, new developments that have an estimated vehicle miles of travel 15 percent below **existing regional and city VMT/capita** (household or home-based) would be considered less than significant.

Analysis Methods

To conduct the VMT assessment, Fehr & Peers used the CCTA travel demand model as well as information from the Metropolitan Transportation Commission (MTC). The CCTA model was used to estimate average trip lengths for the proposed project, while MTC data⁹ was used to establish average trip lengths for existing residential uses in Unincorporated Contra Costa County, Pleasant Hill, Concord and Walnut Creek. The existing average trip lengths for the City of Pleasant Hill, Contra Costa County and the Bay Area based on the MTC data are presented in **Table 14**. Home based trips in Pleasant Hill and Contra Costa County are slightly higher than the Bay Area average, while work based trips to jobs in Pleasant Hill are lower than the county average, but higher than the Bay Area average, indicating that people who have jobs in Pleasant Hill tend to commute longer than average distances than the remainder of the Bay Area.

Table 14: Home Based VMT Per Capita by Jurisdiction

Trip Type	Pleasant Hill	Concord	Walnut Creek	Contra Costa County	Unincorporated Contra Costa County	Bay Area
Home Based VMT	17.5	16.3	17.4	18.0	19.7	15.3

Source: Source: MTC, Fehr & Peers, 2019.

Analysis Results

A select zone analysis was conducted using the CCTA model whereby all the trips generated by the residential portion of the project were tracked through the transportation system. Based on this analysis, the proposed project is estimated to generate approximately **11.4 vehicle miles of travel** per day per capita. This includes all trips generated by each household that either start or end at home. This level of vehicle travel is lower than the Bay Area average and significantly lower than any of the surrounding jurisdictions.

⁹ <http://analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerCapita>

VMT Conclusions

Results of the VMT analysis indicate that the project would contribute to a decrease in vehicle miles of travel on a per-capita basis as the project adds a housing development in an area close to transit and employment centers, and it would generate VMT at least 15 percent below the County baseline. As there are no thresholds of significance, this analysis is being prepared for informational purposes only.

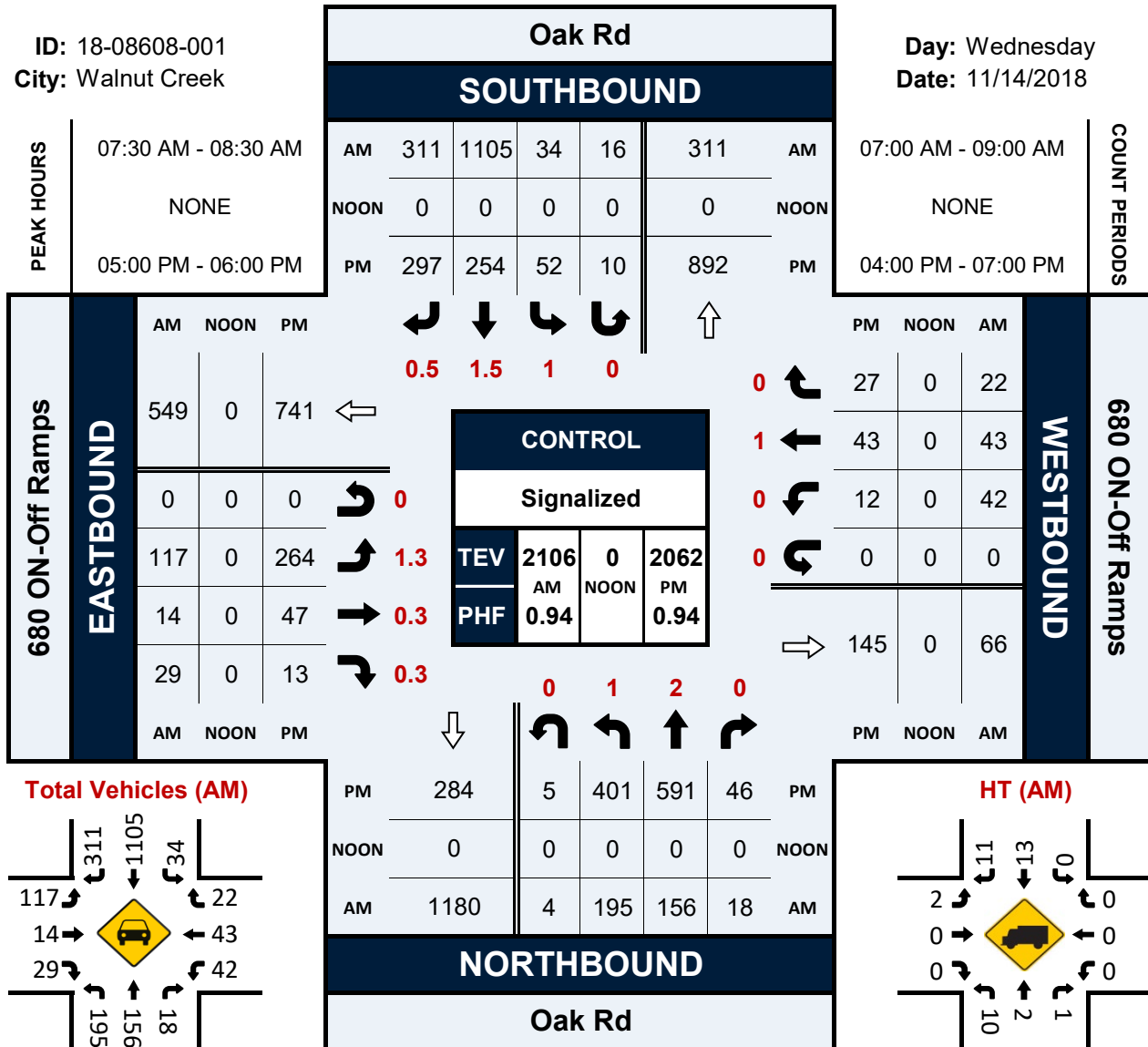
Appendix A: Traffic Counts

Oak Rd & 680 ON-Off Ramps

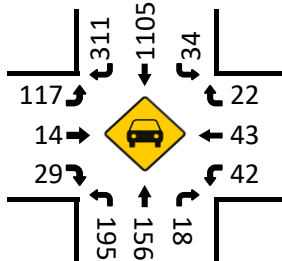
Peak Hour Turning Movement Count

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City: Walnut Creek

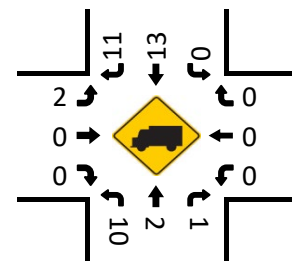
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Date: 11/14/2018



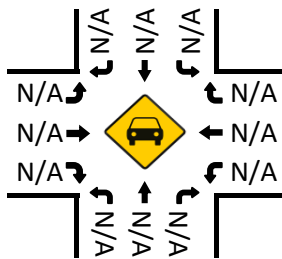
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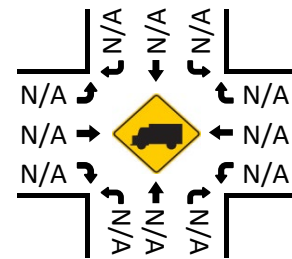
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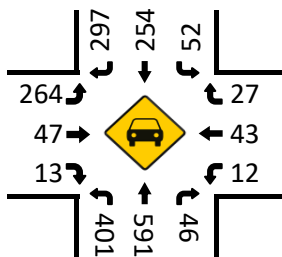
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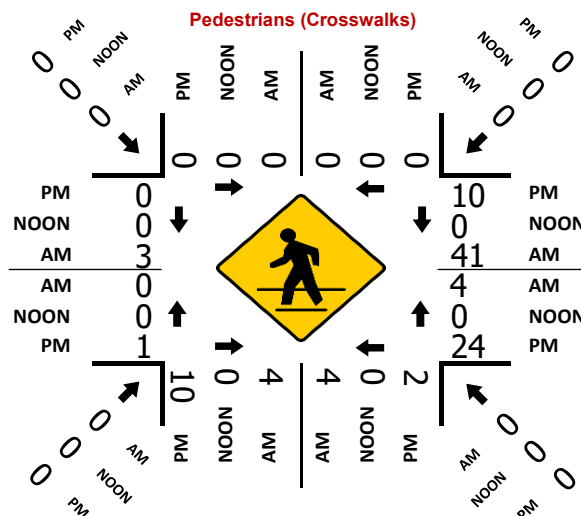
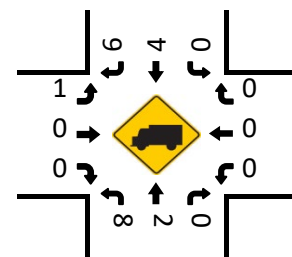
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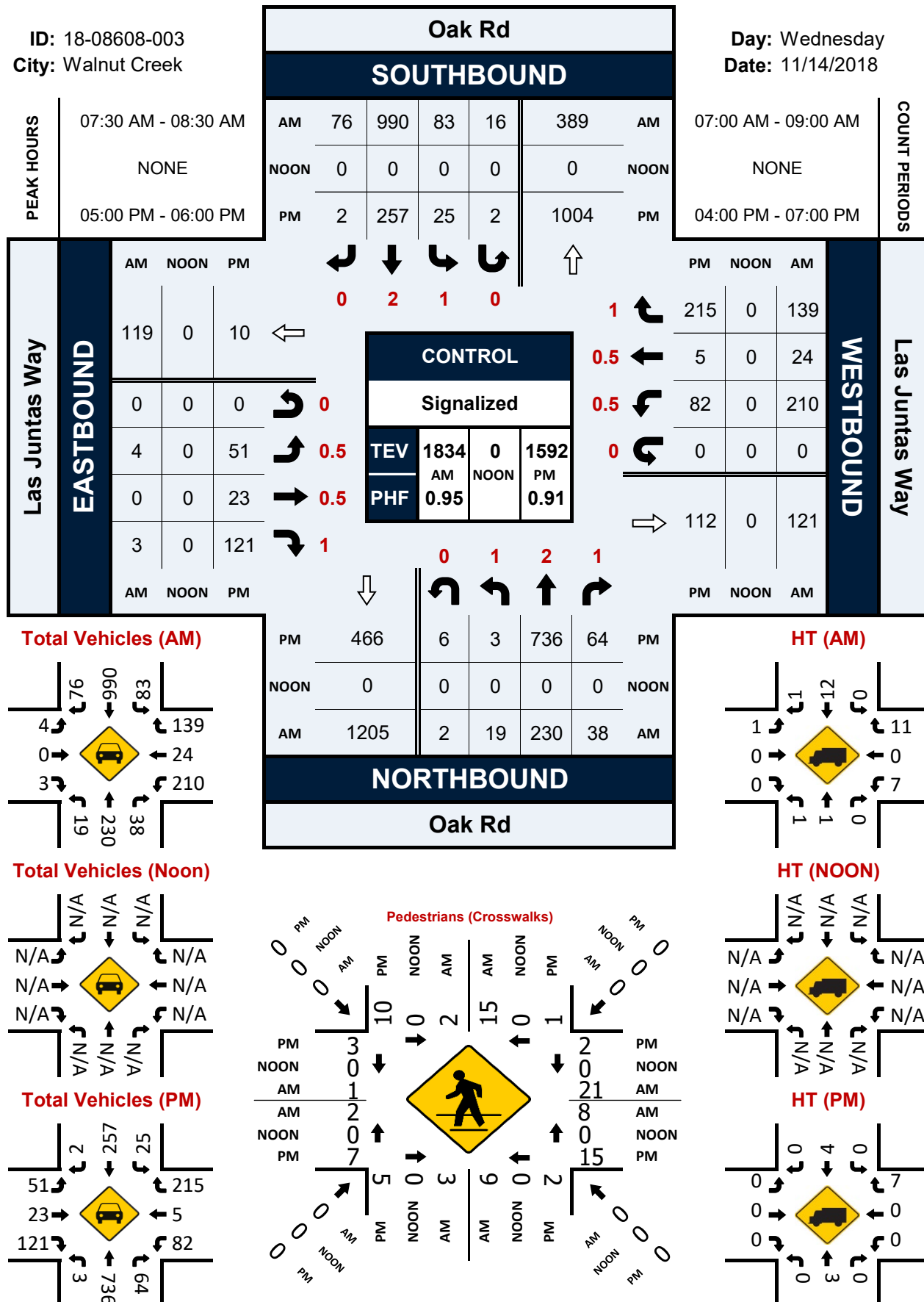
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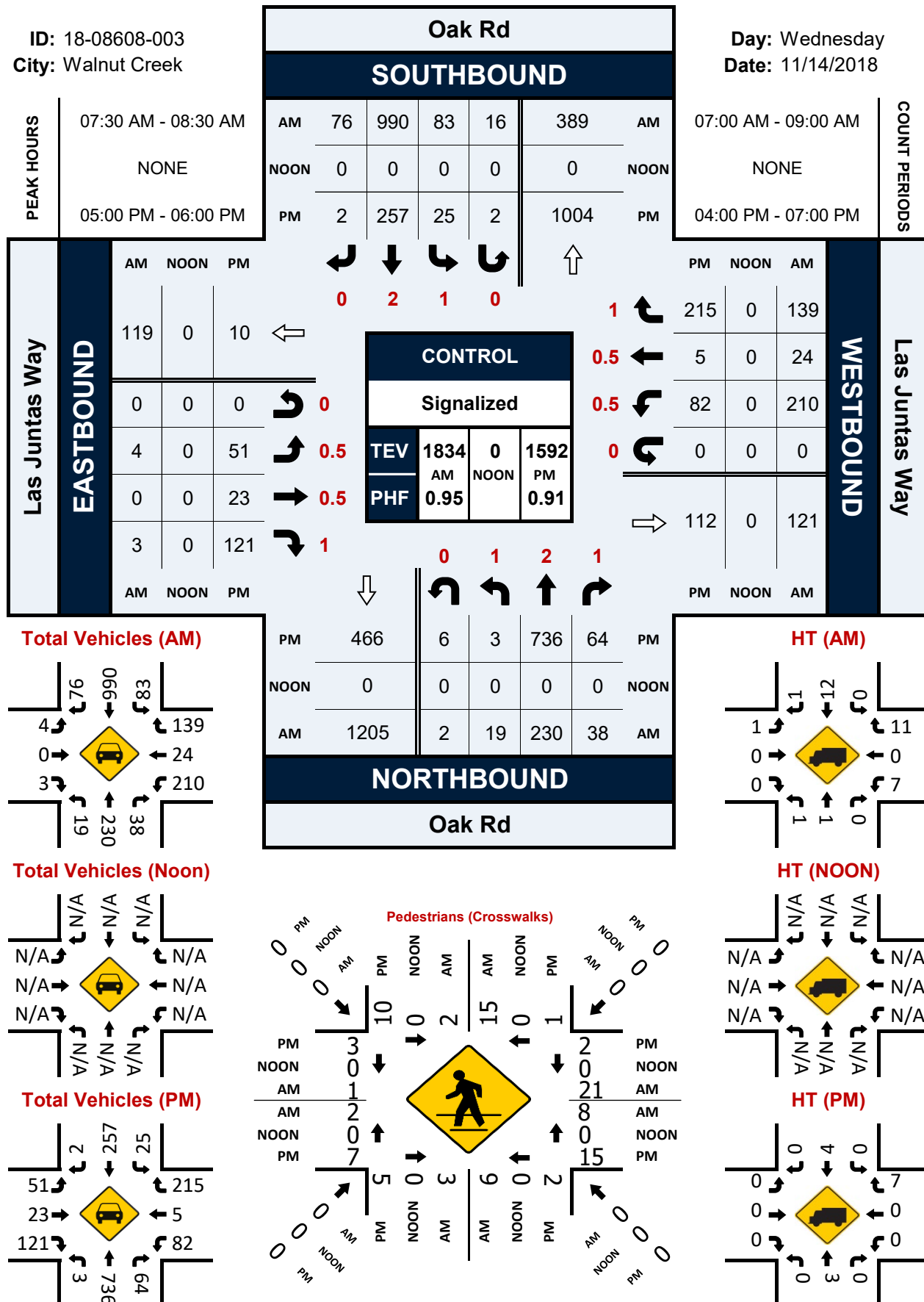
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Date: 11/14/2018



Day: Wednesday
Date: 11/14/2018

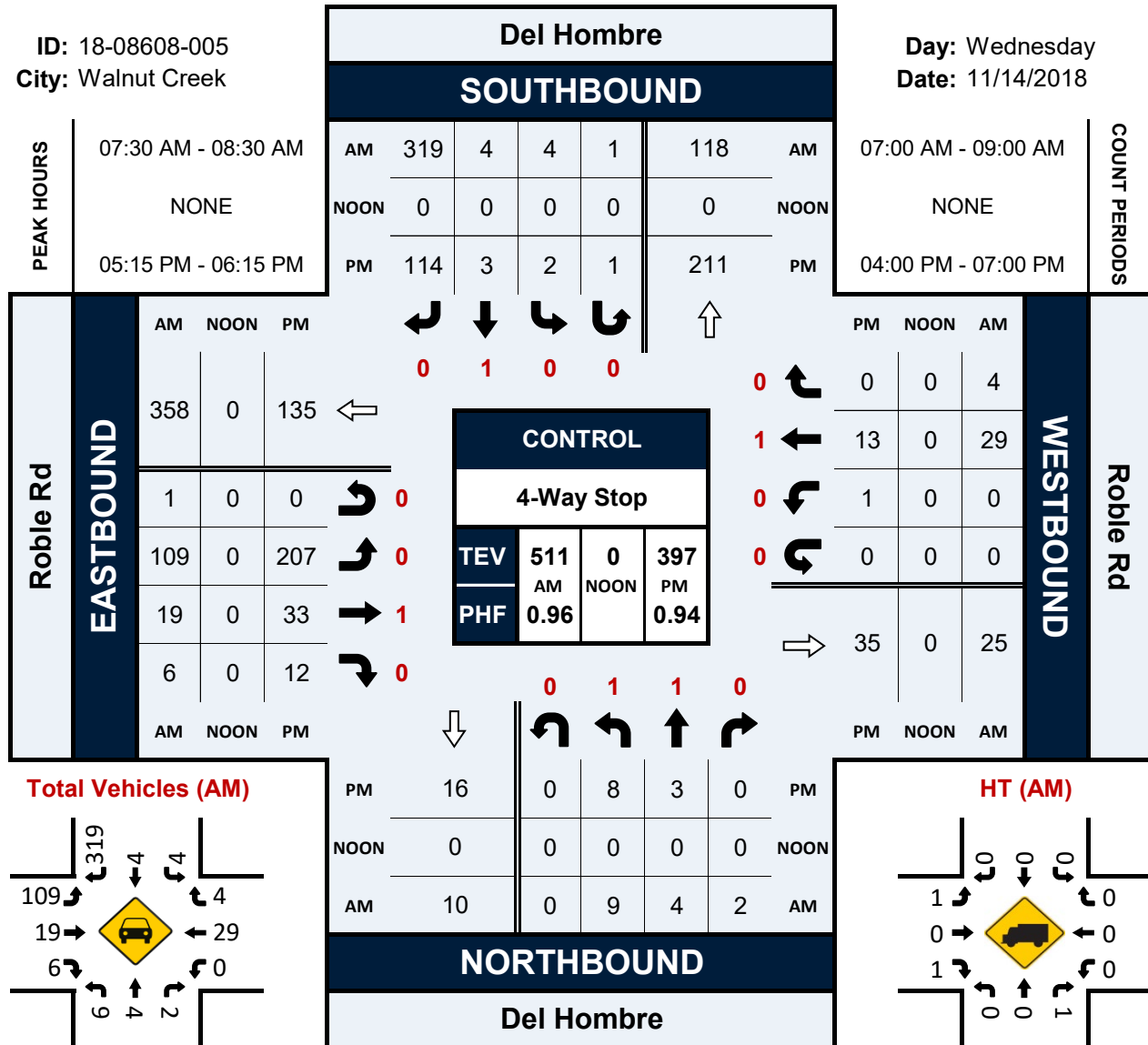


Del Hombre & Roble Rd

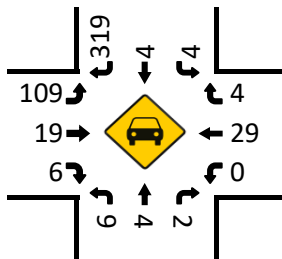
Peak Hour Turning Movement Count

ID: 18-08608-005
City: Walnut Creek

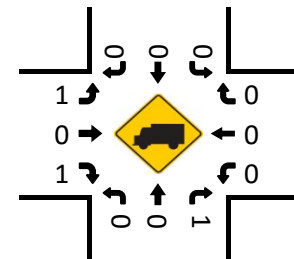
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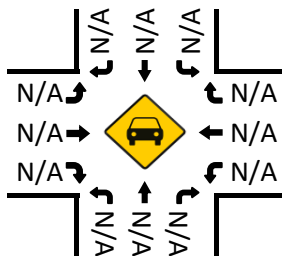
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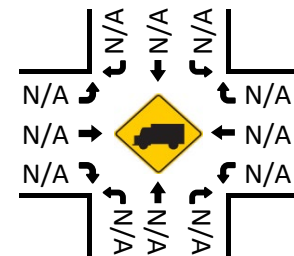
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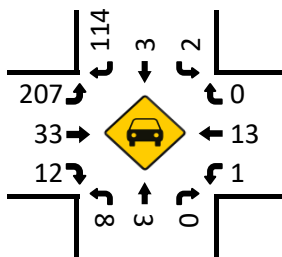
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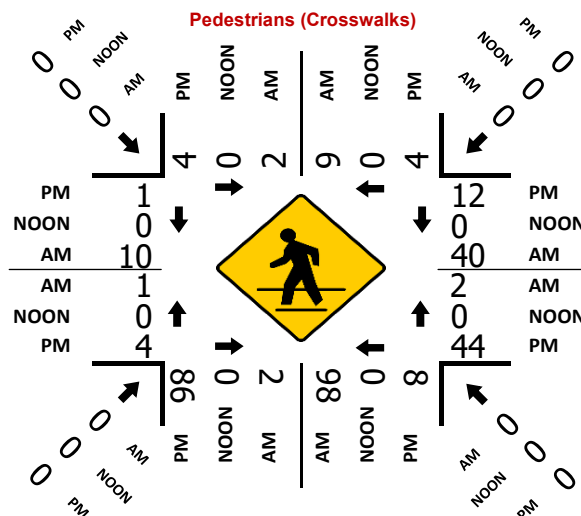
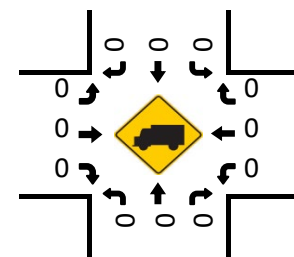
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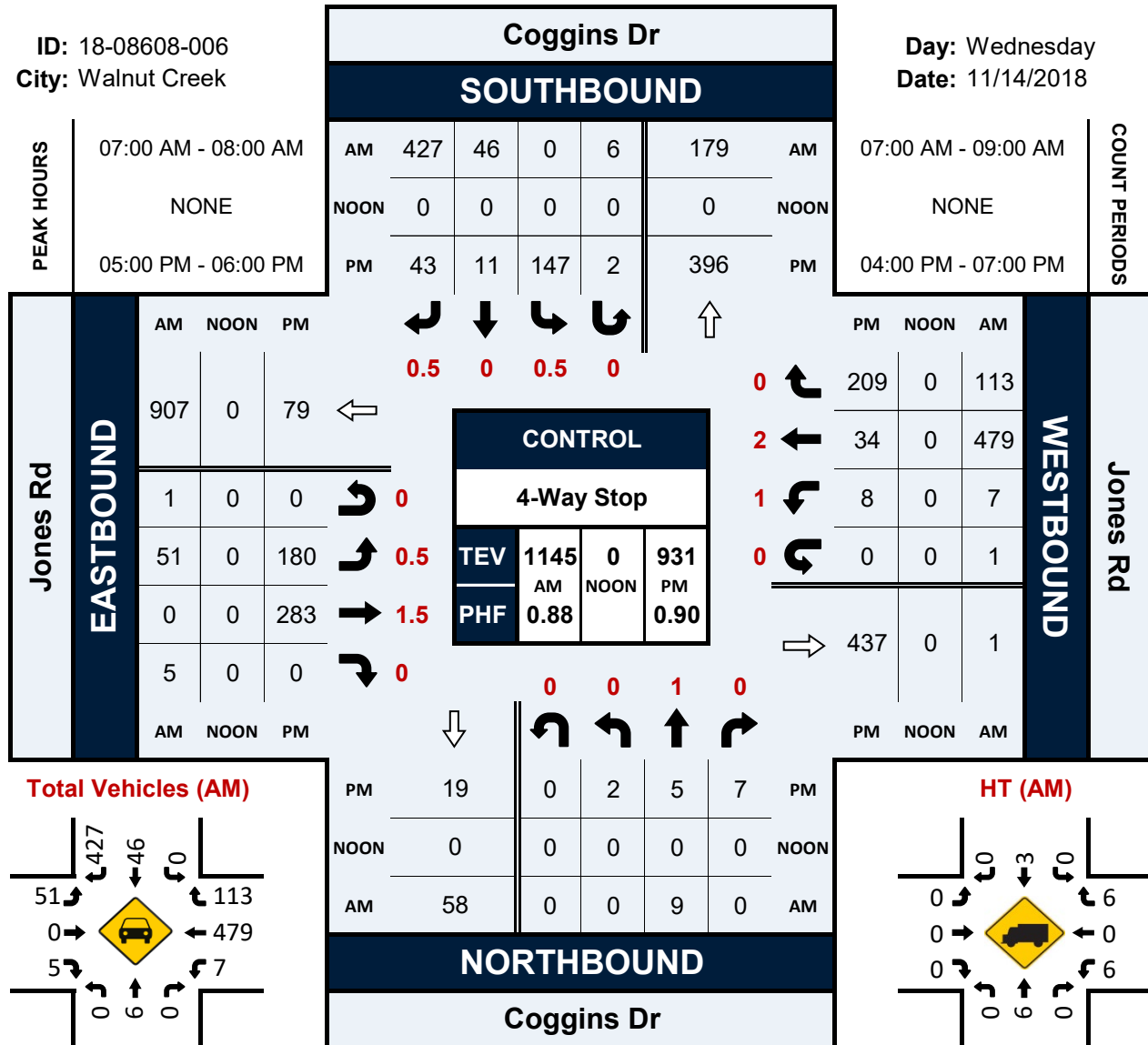


Coggins Dr & Jones Rd

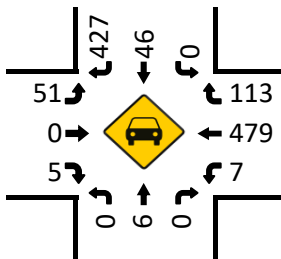
Peak Hour Turning Movement Count

ID: 18-08608-006
City: Walnut Creek

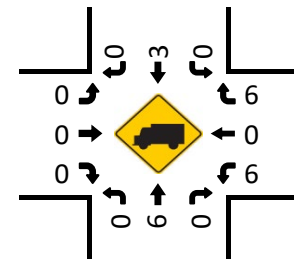
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Date: 11/14/2018



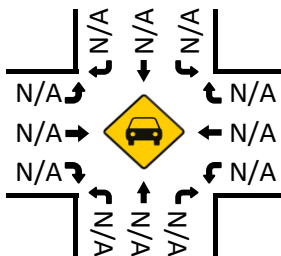
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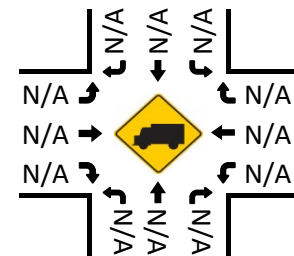
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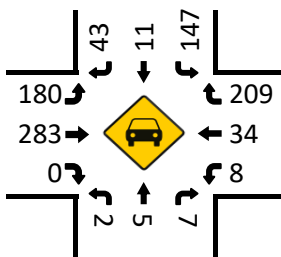
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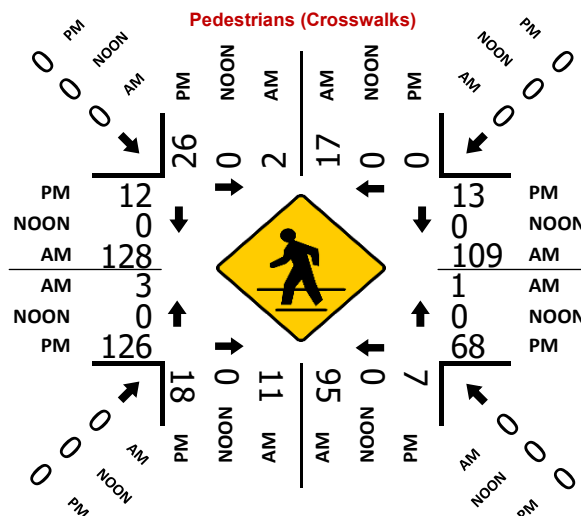
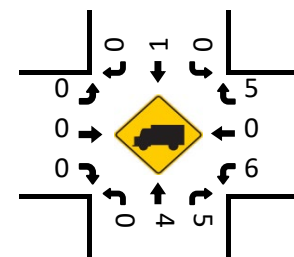
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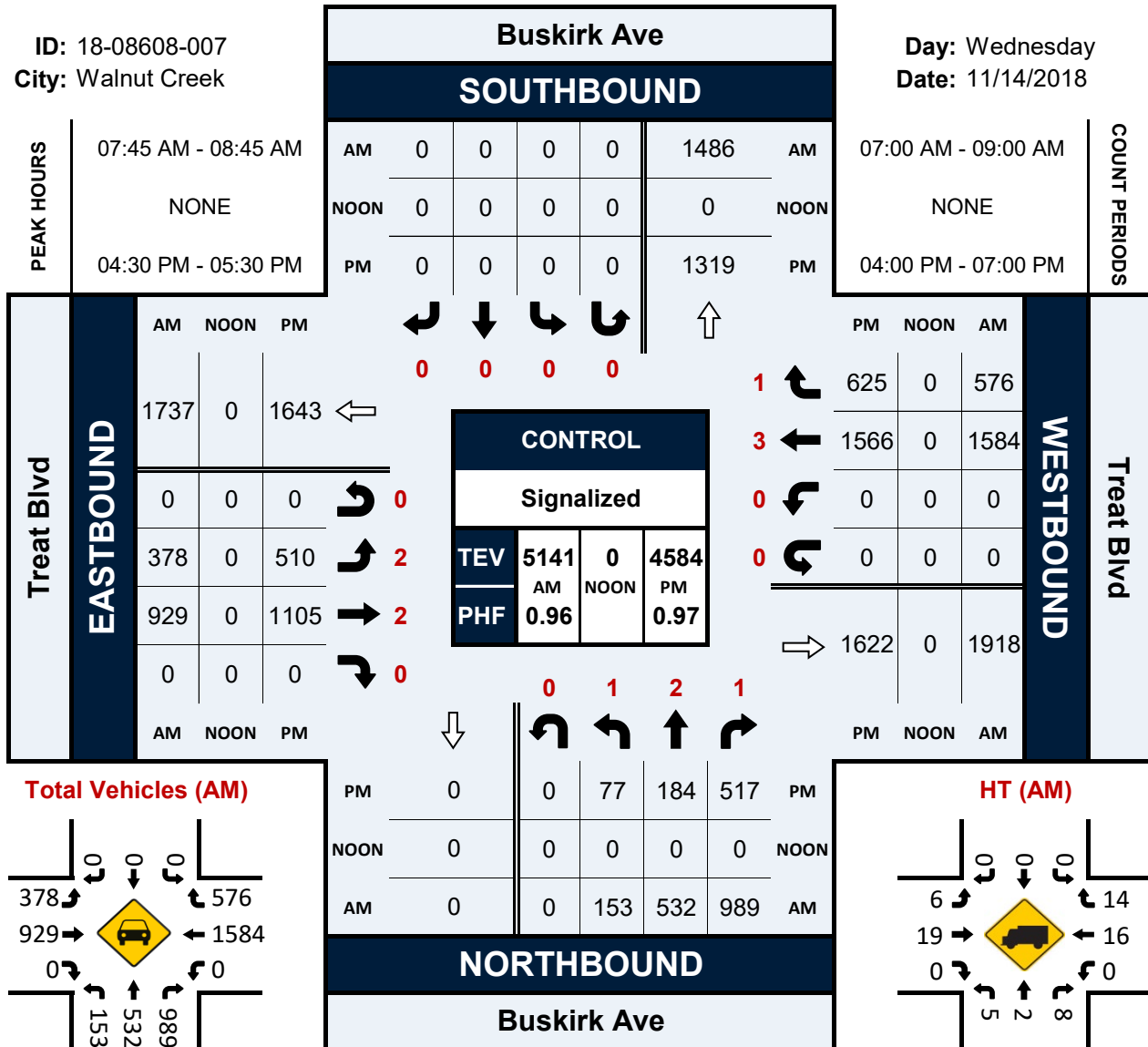


Buskirk Ave & Treat Blvd

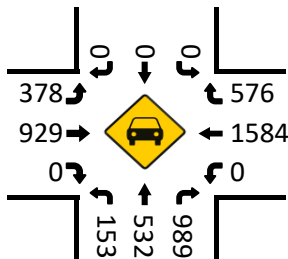
Peak Hour Turning Movement Count

ID: 18-08608-007
City: Walnut Creek

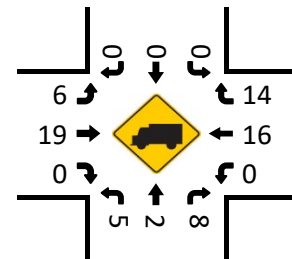
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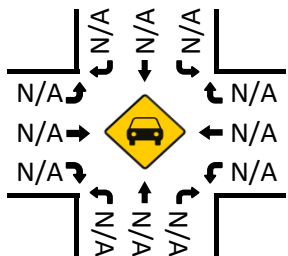
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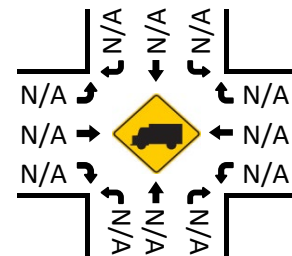
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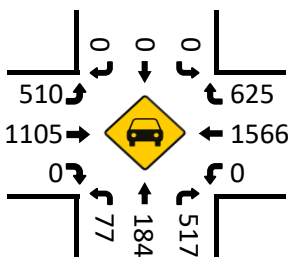
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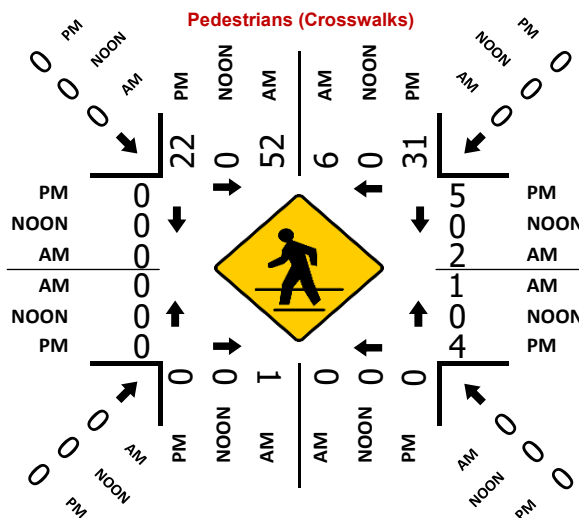
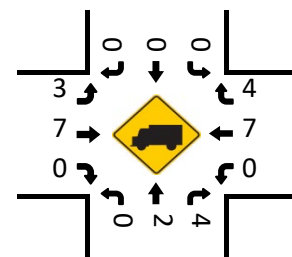
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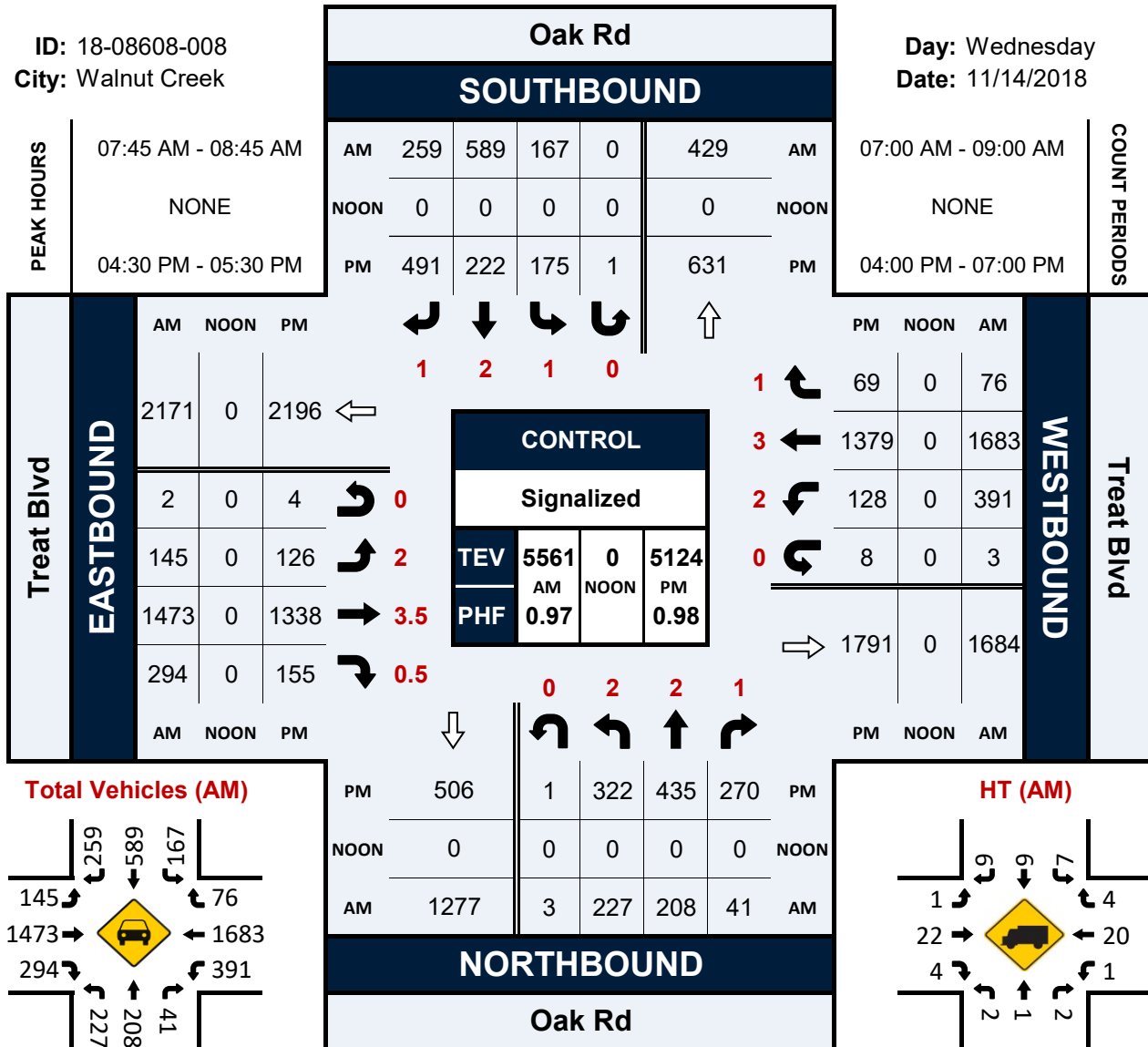


Oak Rd & Treat Blvd

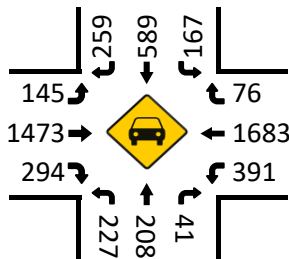
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City: Walnut Creek

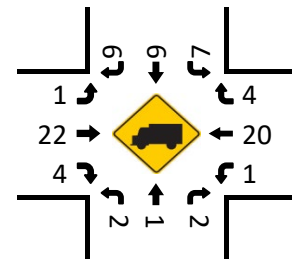
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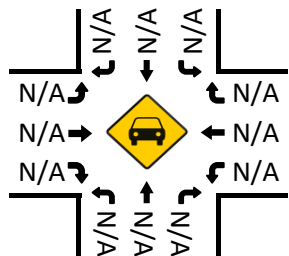
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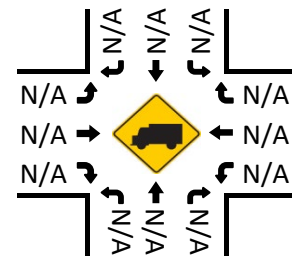
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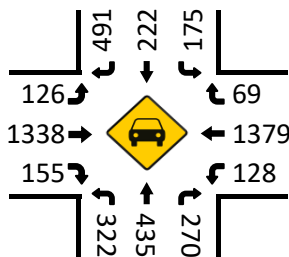
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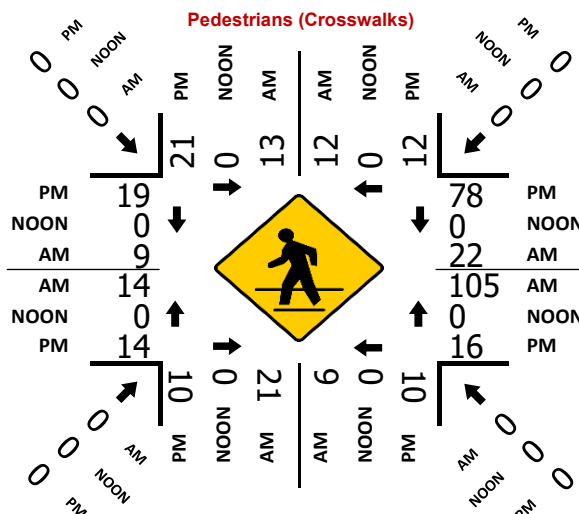
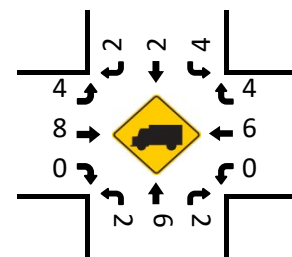
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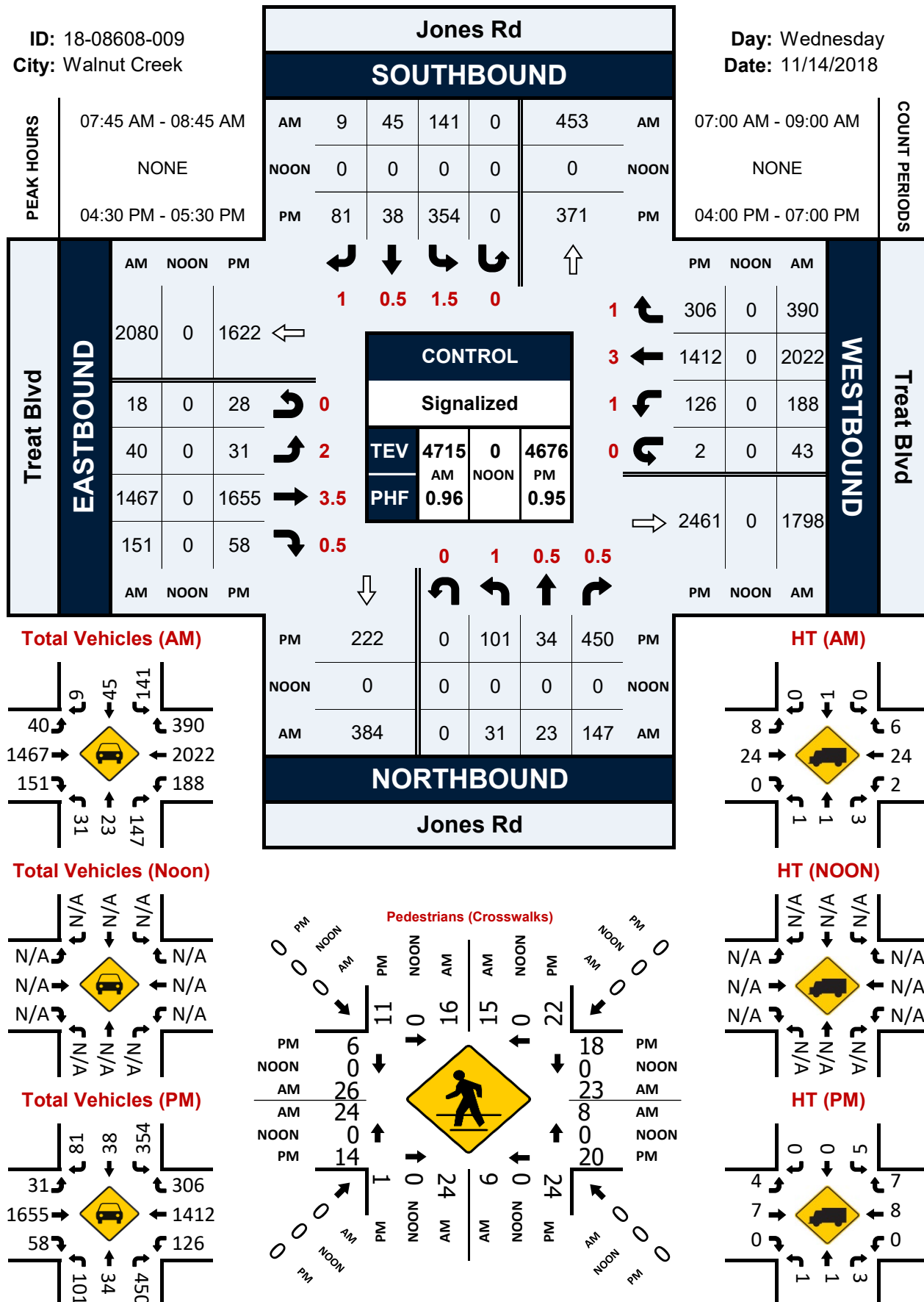
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Date: 11/14/2018

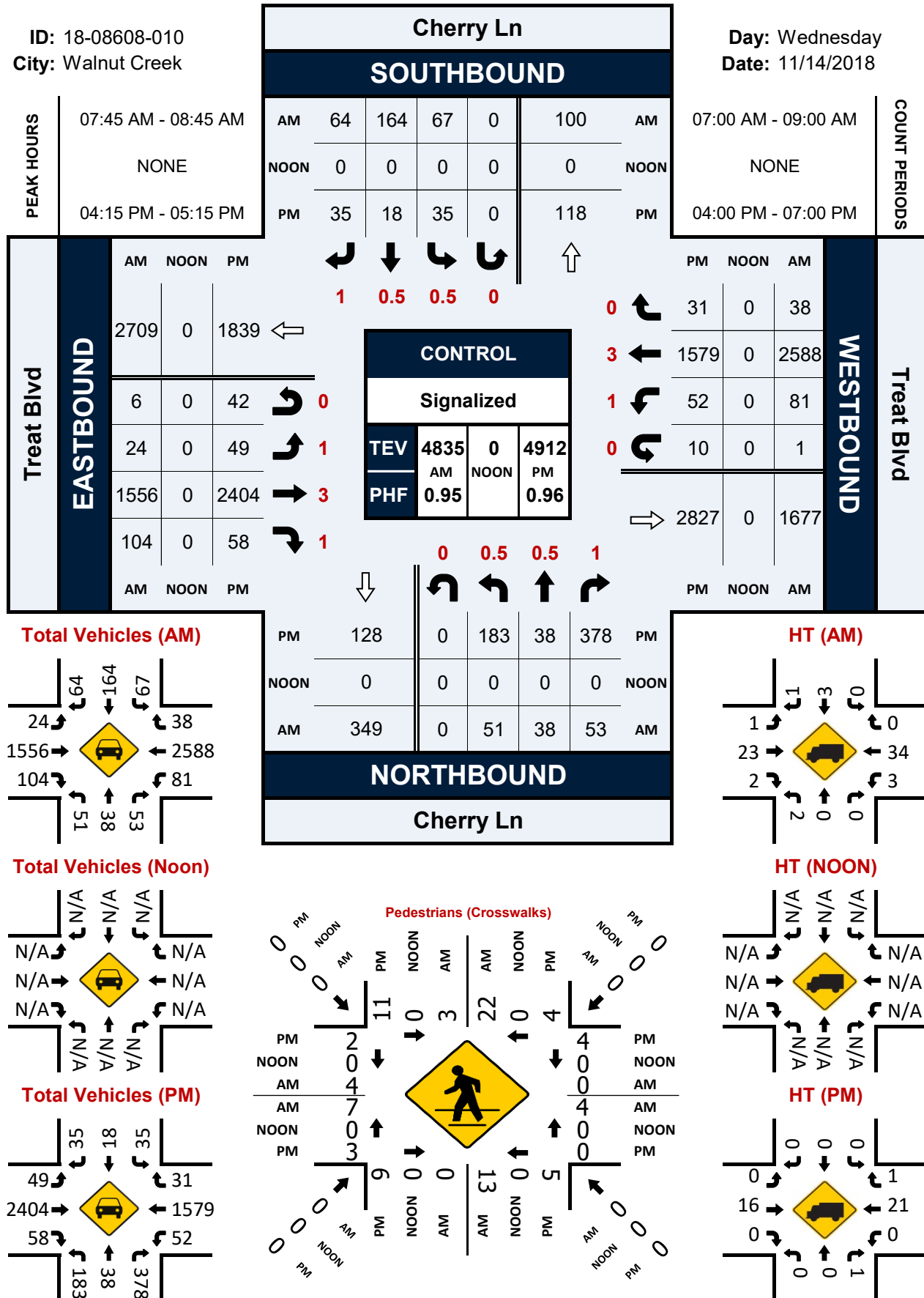


Cherry Ln & Treat Blvd

Peak Hour Turning Movement Count

ID: 18-08608-010
City: Walnut Creek

Day: Wednesday
Date: 11/14/2018

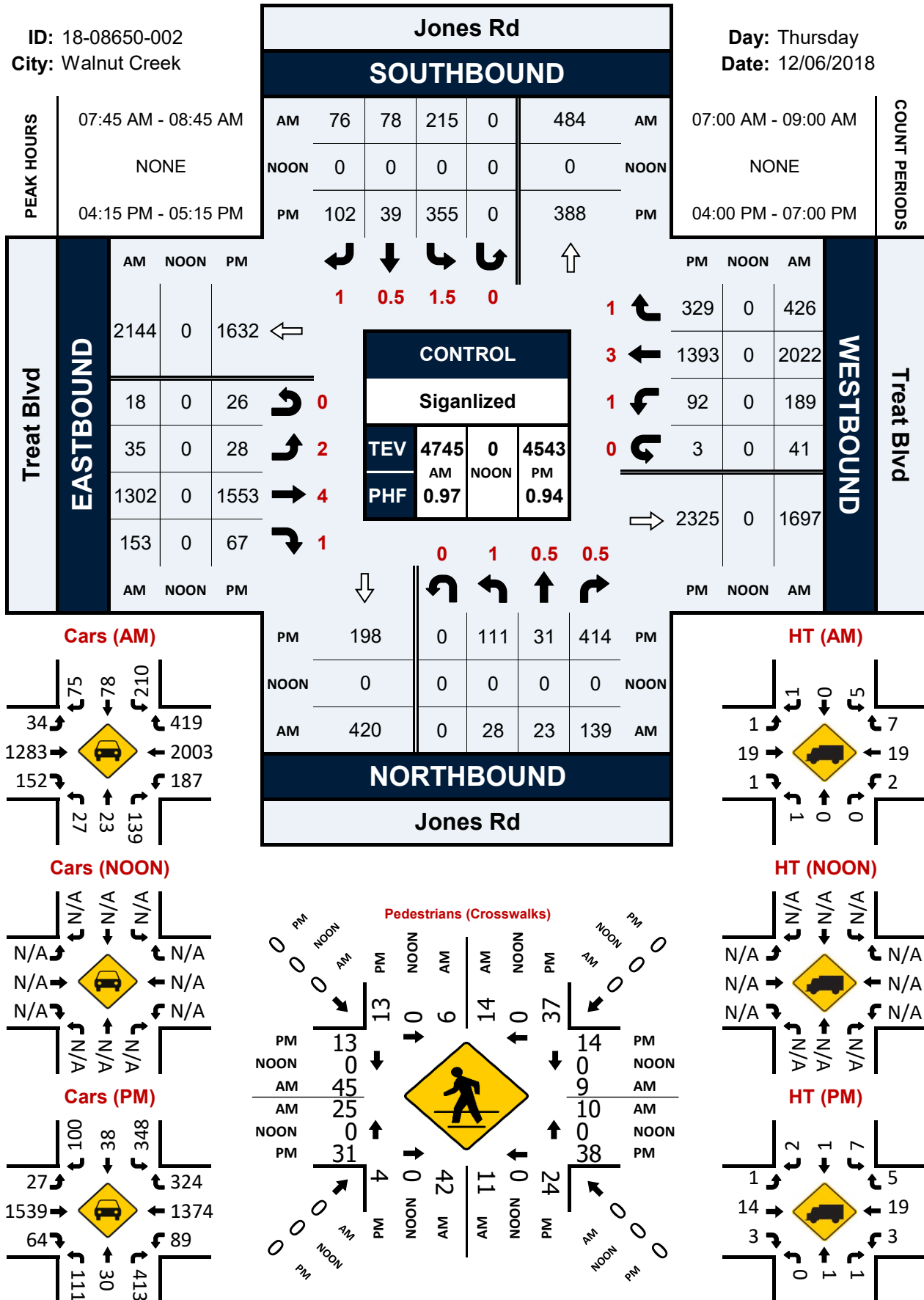


Jones Rd & Treat Blvd

Peak Hour Turning Movement Count

ID: 18-08650-002
City: Walnut Creek

Day: Thursday
Date: 12/06/2018

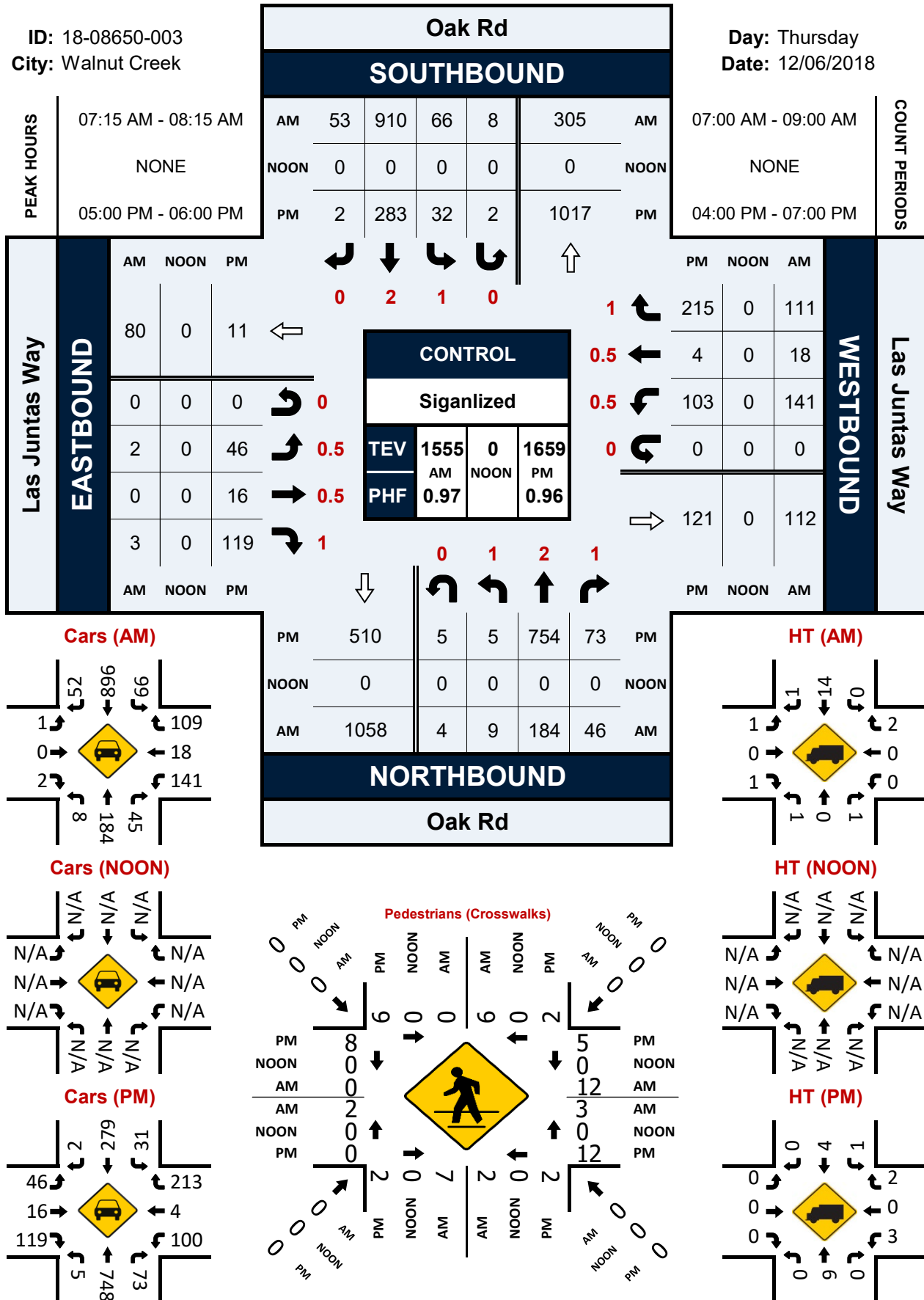


Oak Rd & Las Juntas Way

Peak Hour Turning Movement Count

ID: 18-08650-003
City: Walnut Creek

Day: Thursday
Date: 12/06/2018



Appendix B: LOS Worksheets

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	12	37	39	25	20	186	165	13	53	1009	298
Future Volume (veh/h)	134	12	37	39	25	20	186	165	13	53	1009	298
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1846	1900	1900	1846	1900	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	94	93	24	44	28	15	209	185	13	60	1134	322
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	181	147	38	57	36	20	242	2107	147	77	1453	407
Arrive On Green	0.10	0.10	0.10	0.06	0.06	0.06	0.14	0.63	0.62	0.04	0.54	0.52
Sat Flow, veh/h	1740	1410	364	884	563	301	1740	3343	233	1740	2715	760
Grp Volume(v), veh/h	94	0	117	87	0	0	209	97	101	60	734	722
Grp Sat Flow(s),veh/h/ln	1740	0	1773	1748	0	0	1740	1770	1806	1740	1770	1706
Q Serve(g_s), s	5.2	0.0	6.5	5.0	0.0	0.0	12.0	2.2	2.2	3.5	33.6	35.0
Cycle Q Clear(g_c), s	5.2	0.0	6.5	5.0	0.0	0.0	12.0	2.2	2.2	3.5	33.6	35.0
Prop In Lane	1.00		0.21	0.51		0.17	1.00		0.13	1.00		0.45
Lane Grp Cap(c), veh/h	181	0	185	113	0	0	242	1115	1138	77	947	913
V/C Ratio(X)	0.52	0.00	0.63	0.77	0.00	0.00	0.86	0.09	0.09	0.78	0.77	0.79
Avail Cap(c_a), veh/h	545	0	556	377	0	0	545	1115	1138	545	1100	1060
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.3	0.0	43.9	47.0	0.0	0.0	43.0	7.4	7.4	48.3	18.8	19.4
Incr Delay (d2), s/veh	0.9	0.0	1.3	4.1	0.0	0.0	3.5	0.0	0.0	6.1	3.4	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	3.2	2.5	0.0	0.0	6.0	1.1	1.1	1.8	17.2	17.3
LnGrp Delay(d),s/veh	44.2	0.0	45.2	51.1	0.0	0.0	46.5	7.4	7.5	54.4	22.2	23.4
LnGrp LOS	D		D	D			D	A	A	D	C	C
Approach Vol, veh/h		211			87			407			1516	
Approach Delay, s/veh		44.8			51.1			27.5			24.1	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.5	68.4		14.6	18.2	58.7		10.6				
Change Period (Y+Rc), s	4.0	5.5		4.0	4.0	5.5		4.0				
Max Green Setting (Gmax), s	32.0	62.0		32.0	32.0	62.0		22.0				
Max Q Clear Time (g_c+l1), s	5.5	4.2		8.5	14.0	37.0		7.0				
Green Ext Time (p_c), s	0.1	1.8		0.5	0.3	16.2		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				27.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↰	↰	↱	↰	↰
Traffic Volume (veh/h)	4	0	5	172	25	140	23	235	38	101	901	93
Future Volume (veh/h)	4	0	5	172	25	140	23	235	38	101	901	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.95	1.00		0.95	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1831	1863	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	4	0	3	189	27	63	25	258	29	111	990	98
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	0	224	187	0	224	163	27	2274	248	143	1809	179
Arrive On Green	0.00	0.00	0.12	0.00	0.12	0.12	0.02	0.49	0.47	0.08	0.56	0.53
Sat Flow, veh/h	0	1827	1525	0	1831	1336	1740	4629	504	1740	3243	321
Grp Volume(v), veh/h	0	0	3	0	27	63	25	187	100	111	540	548
Grp Sat Flow(s), veh/h/ln	0	1827	1525	0	1831	1336	1740	1695	1743	1740	1770	1794
Q Serve(g_s), s	0.0	0.0	0.1	0.0	0.5	1.7	0.6	1.2	1.2	2.5	7.7	7.7
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.0	0.5	1.7	0.6	1.2	1.2	2.5	7.7	7.7
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.29	1.00		0.18
Lane Grp Cap(c), veh/h	0	224	187	0	224	163	27	1666	856	143	987	1001
V/C Ratio(X)	0.00	0.00	0.02	0.00	0.12	0.39	0.91	0.11	0.12	0.78	0.55	0.55
Avail Cap(c_a), veh/h	0	1481	1236	0	1948	1421	1410	2834	1457	1410	1479	1500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	15.2	0.0	15.4	16.0	19.4	5.4	5.5	17.8	5.6	5.6
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.1	0.6	31.2	0.0	0.1	3.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.3	0.6	0.5	0.6	0.6	1.3	3.8	3.9
LnGrp Delay(d),s/veh	0.0	0.0	15.2	0.0	15.5	16.5	50.6	5.4	5.6	21.1	6.2	6.3
LnGrp LOS			B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		3			90			312			1199	
Approach Delay, s/veh		15.2			16.2			9.1			7.6	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.2	23.4	0.0	8.8	4.6	26.0	0.0	8.8				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	14.5	3.2	0.0	2.1	2.6	9.7	0.0	3.7				
Green Ext Time (p_c), s	0.1	2.6	0.0	0.0	0.0	11.0	0.0	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			8.4									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Existing AM

Intersection

Intersection Delay, s/veh 18.2

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	43	37	107	192	28	95	61	44	55	241	53
Future Vol, veh/h	17	43	37	107	192	28	95	61	44	55	241	53
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	19	49	42	122	218	32	108	69	50	63	274	60
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	11.2	20.6	13.8	20.3
HCM LOS	B	C	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	47%	100%	0%	33%	16%
Vol Thru, %	31%	0%	54%	59%	69%
Vol Right, %	22%	0%	46%	9%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	200	17	80	327	349
LT Vol	95	17	0	107	55
Through Vol	61	0	43	192	241
RT Vol	44	0	37	28	53
Lane Flow Rate	227	19	91	372	397
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.404	0.042	0.176	0.654	0.665
Departure Headway (Hd)	6.406	7.878	6.98	6.332	6.038
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	561	454	513	572	599
Service Time	4.454	5.635	4.736	4.371	4.076
HCM Lane V/C Ratio	0.405	0.042	0.177	0.65	0.663
HCM Control Delay	13.8	11	11.2	20.6	20.3
HCM Lane LOS	B	B	B	C	C
HCM 95th-tile Q	1.9	0.1	0.6	4.7	5

Intersection

Intersection Delay, s/veh 9.1

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Traffic Vol, veh/h	112	19	10	0	25	4	13	5	1	5	4	288
Future Vol, veh/h	112	19	10	0	25	4	13	5	1	5	4	288
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	1	1	2	1	1	2	1	1	2	1	1
Mvmt Flow	123	21	11	0	27	4	14	5	1	5	4	316
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	9.1	8	8.4	9.2
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	79%	0%	2%
Vol Thru, %	0%	83%	13%	86%	1%
Vol Right, %	0%	17%	7%	14%	97%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	13	6	141	29	297
LT Vol	13	0	112	0	5
Through Vol	0	5	19	25	4
RT Vol	0	1	10	4	288
Lane Flow Rate	14	7	155	32	326
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.023	0.009	0.207	0.042	0.358
Departure Headway (Hd)	5.754	5.116	4.81	4.756	3.952
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	623	700	745	752	911
Service Time	3.482	2.843	2.841	2.792	1.968
HCM Lane V/C Ratio	0.022	0.01	0.208	0.043	0.358
HCM Control Delay	8.6	7.9	9.1	8	9.2
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0.8	0.1	1.6

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	40	39	65	46	45	71	219	39	111	759	207
Future Volume (veh/h)	35	40	39	65	46	45	71	219	39	111	759	207
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.92	1.00		0.94	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1900	1863	1881	1881	1863	1881	1900
Adj Flow Rate, veh/h	38	43	6	71	50	19	77	238	18	121	825	210
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	259	456	62	280	200	76	100	1331	561	156	1133	288
Arrive On Green	0.15	0.15	0.15	0.16	0.16	0.16	0.06	0.37	0.37	0.09	0.40	0.39
Sat Flow, veh/h	1774	3129	423	1774	1266	481	1774	3574	1507	1774	2802	713
Grp Volume(v), veh/h	38	24	25	71	0	69	77	238	18	121	526	509
Grp Sat Flow(s),veh/h/ln	1774	1787	1764	1774	0	1747	1774	1787	1507	1774	1787	1728
Q Serve(g_s), s	1.3	0.8	0.8	2.4	0.0	2.3	2.9	3.0	0.5	4.5	16.8	16.9
Cycle Q Clear(g_c), s	1.3	0.8	0.8	2.4	0.0	2.3	2.9	3.0	0.5	4.5	16.8	16.9
Prop In Lane	1.00		0.24	1.00		0.28	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	259	260	257	280	0	275	100	1331	561	156	723	699
V/C Ratio(X)	0.15	0.09	0.10	0.25	0.00	0.25	0.77	0.18	0.03	0.77	0.73	0.73
Avail Cap(c_a), veh/h	681	686	677	681	0	670	576	1741	734	576	870	841
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	25.1	25.1	25.0	0.0	25.0	31.6	14.3	13.5	30.2	17.0	17.2
Incr Delay (d2), s/veh	0.1	0.1	0.1	0.2	0.0	0.2	4.7	0.1	0.0	3.1	3.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.4	0.4	1.2	0.0	1.1	1.5	1.5	0.2	2.4	8.8	8.5
LnGrp Delay(d),s/veh	25.4	25.1	25.1	25.2	0.0	25.2	36.3	14.4	13.5	33.3	20.0	20.3
LnGrp LOS	C	C	C	C		C	D	B	B	C	B	C
Approach Vol, veh/h	87		140			333			1156			
Approach Delay, s/veh	25.2		25.2			19.4			21.5			
Approach LOS	C		C			B			C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	29.2		13.9	7.8	31.4		14.7				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+I), s	10.5	5.0		3.3	4.9	18.9		4.4				
Green Ext Time (p_c), s	0.1	2.2		0.2	0.1	7.5		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			21.6									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh 17.8

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	21	41	1	6	154	148	0	4	6	278	8	139
Future Vol, veh/h	21	41	1	6	154	148	0	4	6	278	8	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	23	45	1	7	167	161	0	4	7	302	9	151
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	10.5	11	8.8	24
HCM LOS	B	B	A	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	51%	0%	100%	0%	0%	65%
Vol Thru, %	40%	49%	95%	0%	100%	26%	2%
Vol Right, %	60%	0%	5%	0%	0%	74%	33%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	42	22	6	103	199	425
LT Vol	0	21	0	6	0	0	278
Through Vol	4	21	21	0	103	51	8
RT Vol	6	0	1	0	0	148	139
Lane Flow Rate	11	45	23	7	112	217	462
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.018	0.092	0.045	0.012	0.192	0.34	0.749
Departure Headway (Hd)	5.969	7.304	6.959	6.738	6.178	5.649	5.838
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	599	490	514	531	581	637	619
Service Time	3.713	5.055	4.71	4.475	3.914	3.386	3.562
HCM Lane V/C Ratio	0.018	0.092	0.045	0.013	0.193	0.341	0.746
HCM Control Delay	8.8	10.8	10	9.6	10.4	11.3	24
HCM Lane LOS	A	B	A	A	B	B	C
HCM 95th-tile Q	0.1	0.3	0.1	0	0.7	1.5	6.7

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	929	0	0	1584	576	153	532	989	0	0	0
Future Volume (veh/h)	378	929	0	0	1584	576	153	532	989	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	394	968	0	0	1650	0	159	554	0			
Adj No. of Lanes	2	2	0	0	3	1	1	2	1			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	444	2711	0	0	3096	964	320	644	288			
Arrive On Green	0.13	0.76	0.00	0.00	1.00	0.00	0.18	0.18	0.00			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	3574	1599			
Grp Volume(v), veh/h	394	968	0	0	1650	0	159	554	0			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1787	1599			
Q Serve(g_s), s	16.9	13.5	0.0	0.0	0.0	0.0	12.1	22.6	0.0			
Cycle Q Clear(g_c), s	16.9	13.5	0.0	0.0	0.0	0.0	12.1	22.6	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	444	2711	0	0	3096	964	320	644	288			
V/C Ratio(X)	0.89	0.36	0.00	0.00	0.53	0.00	0.50	0.86	0.00			
Avail Cap(c_a), veh/h	574	2711	0	0	3096	964	412	829	371			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.61	0.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh	64.3	6.0	0.0	0.0	0.0	0.0	55.4	59.7	0.0			
Incr Delay (d2), s/veh	11.2	0.4	0.0	0.0	0.4	0.0	0.4	6.1	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.7	6.7	0.0	0.0	0.1	0.0	6.0	11.7	0.0			
LnGrp Delay(d),s/veh	75.4	6.4	0.0	0.0	0.4	0.0	55.8	65.8	0.0			
LnGrp LOS	E	A			A		E	E				
Approach Vol, veh/h	1362				1650			713				
Approach Delay, s/veh	26.3				0.4			63.6				
Approach LOS	C				A			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2				5	6		8				
Phs Duration (G+Y+Rc), s	118.8				23.3	95.4		31.2				
Change Period (Y+Rc), s	5.0				4.0	5.0		4.2				
Max Green Setting (Gmax), s	106.0				25.0	77.0		34.8				
Max Q Clear Time (g_c+I1), s	15.5				18.9	2.0		24.6				
Green Ext Time (p_c), s	27.1				0.4	53.1		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			22.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	   		 	  		 	 			 	
Traffic Volume (veh/h)	147	1473	294	394	1722	76	230	208	41	75	566	220
Future Volume (veh/h)	147	1473	294	394	1722	76	230	208	41	75	566	220
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.85	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	152	1519	281	406	1775	0	237	214	12	77	584	0
Adj No. of Lanes	2	4	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	196	2249	416	456	2485	638	284	995	379	96	894	400
Arrive On Green	0.11	0.82	0.82	0.13	0.48	0.00	0.08	0.28	0.28	0.05	0.25	0.00
Sat Flow, veh/h	3442	5509	1019	3442	5136	1319	3442	3574	1361	1774	3574	1599
Grp Volume(v), veh/h	152	1338	462	406	1775	0	237	214	12	77	584	0
Grp Sat Flow(s),veh/h/ln	1721	1618	1674	1721	1712	1319	1721	1787	1361	1774	1787	1599
Q Serve(g_s), s	6.4	16.9	17.0	17.4	40.9	0.0	10.2	6.9	1.0	6.4	22.0	0.0
Cycle Q Clear(g_c), s	6.4	16.9	17.0	17.4	40.9	0.0	10.2	6.9	1.0	6.4	22.0	0.0
Prop In Lane	1.00		0.61	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	1981	683	456	2485	638	284	995	379	96	894	400
V/C Ratio(X)	0.78	0.68	0.68	0.89	0.71	0.00	0.83	0.22	0.03	0.80	0.65	0.00
Avail Cap(c_a), veh/h	252	1981	683	597	2485	638	390	995	379	189	905	405
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	0.29	0.29	0.00	1.00	1.00	1.00	0.70	0.70	0.00
Uniform Delay (d), s/veh	65.5	9.7	9.7	64.0	30.5	0.0	67.8	41.5	39.4	70.1	50.4	0.0
Incr Delay (d2), s/veh	1.1	0.2	0.5	3.6	0.5	0.0	8.1	0.0	0.0	4.0	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	7.2	7.5	8.5	19.4	0.0	5.2	3.4	0.4	3.3	11.0	0.0
LnGrp Delay(d),s/veh	66.6	9.9	10.2	67.6	31.1	0.0	75.9	41.6	39.4	74.2	51.3	0.0
LnGrp LOS	E	A	B	E	C		E	D	D	E	D	
Approach Vol, veh/h	1952					2181		463		661		
Approach Delay, s/veh	14.4					37.9		59.1		54.0		
Approach LOS	B					D		E		D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.9	67.2	16.4	42.5	12.5	78.6	12.1	46.8				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.6	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+11.9), s	19.4	19.0	12.2	24.0	8.4	42.9	8.4	8.9				
Green Ext Time (p_c), s	0.5	27.2	0.2	2.3	0.1	20.1	0.0	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			33.0									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	   			  						 	
Traffic Volume (veh/h)	58	1375	151	231	2022	390	31	23	147	233	68	48
Future Volume (veh/h)	58	1375	151	231	2022	390	31	23	147	233	68	48
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.93	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1871	1881
Adj Flow Rate, veh/h	60	1432	0	241	2106	0	32	24	29	157	191	22
Adj No. of Lanes	2	4	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	126	2567	0	248	2568	799	239	100	121	347	366	285
Arrive On Green	0.01	0.13	0.00	0.14	0.50	0.00	0.13	0.13	0.13	0.20	0.20	0.20
Sat Flow, veh/h	3442	6735	0	1774	5136	1599	1774	744	899	1774	1871	1458
Grp Volume(v), veh/h	60	1432	0	241	2106	0	32	0	53	157	191	22
Grp Sat Flow(s),veh/h/ln	1721	1618	0	1774	1712	1599	1774	0	1644	1774	1871	1458
Q Serve(g_s), s	2.6	31.1	0.0	20.3	52.1	0.0	2.4	0.0	4.3	11.7	13.7	1.8
Cycle Q Clear(g_c), s	2.6	31.1	0.0	20.3	52.1	0.0	2.4	0.0	4.3	11.7	13.7	1.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.55	1.00		1.00
Lane Grp Cap(c), veh/h	126	2567	0	248	2568	799	239	0	221	347	366	285
V/C Ratio(X)	0.47	0.56	0.00	0.97	0.82	0.00	0.13	0.00	0.24	0.45	0.52	0.08
Avail Cap(c_a), veh/h	184	2567	0	248	2568	799	414	0	384	426	449	350
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.00	0.55	0.55	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.7	52.8	0.0	64.2	31.8	0.0	57.2	0.0	58.1	53.3	54.1	49.3
Incr Delay (d2), s/veh	0.6	0.5	0.0	34.5	1.7	0.0	0.1	0.0	0.2	0.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	14.1	0.0	12.4	25.0	0.0	1.2	0.0	2.0	5.8	7.2	0.7
LnGrp Delay(d),s/veh	73.3	53.4	0.0	98.7	33.5	0.0	57.3	0.0	58.3	53.6	54.5	49.3
LnGrp LOS	E	D		F	C		E		E	D	D	D
Approach Vol, veh/h		1492			2347			85			370	
Approach Delay, s/veh		54.2			40.2			57.9			53.8	
Approach LOS		D			D			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	65.5		34.3	9.5	81.0		25.2				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	21.0	38.0		36.0	8.0	51.0		35.0				
Max Q Clear Time (g_c+2.3), s	22.3	33.1		15.7	4.6	54.1		6.3				
Green Ext Time (p_c), s	0.0	4.5		1.0	0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			46.6									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Traffic Volume (veh/h)	30	1556	104	82	2588	38	51	38	53	67	164	64
Future Volume (veh/h)	30	1556	104	82	2588	38	51	38	53	67	164	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.95	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1871	1881	1900	1876	1881
Adj Flow Rate, veh/h	32	1638	74	86	2724	39	54	40	11	71	173	31
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	41	3170	957	82	3339	48	35	17	390	29	38	347
Arrive On Green	0.02	0.62	0.62	0.05	0.64	0.64	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1550	1774	5213	74	0	69	1578	0	153	1404
Grp Volume(v), veh/h	32	1638	74	86	1784	979	94	0	11	244	0	31
Grp Sat Flow(s),veh/h/ln	1774	1712	1550	1774	1712	1864	69	0	1578	153	0	1404
Q Serve(g_s), s	2.9	29.0	3.1	7.5	63.4	64.4	0.0	0.0	0.9	0.0	0.0	2.8
Cycle Q Clear(g_c), s	2.9	29.0	3.1	7.5	63.4	64.4	40.0	0.0	0.9	40.0	0.0	2.8
Prop In Lane	1.00		1.00	1.00		0.04	0.57		1.00	0.29		1.00
Lane Grp Cap(c), veh/h	41	3170	957	82	2193	1194	52	0	390	66	0	347
V/C Ratio(X)	0.78	0.52	0.08	1.05	0.81	0.82	1.80	0.00	0.03	3.67	0.00	0.09
Avail Cap(c_a), veh/h	82	3170	957	82	2193	1194	52	0	390	66	0	347
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.7	17.4	12.5	77.3	21.9	22.0	68.1	0.0	46.3	59.2	0.0	47.0
Incr Delay (d2), s/veh	6.9	0.4	0.1	112.8	3.4	6.4	427.6	0.0	0.0	1238.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	13.8	1.4	6.2	30.8	35.0	8.5	0.0	0.4	25.8	0.0	1.1
LnGrp Delay(d),s/veh	85.6	17.8	12.6	191.0	25.3	28.4	495.7	0.0	46.3	1297.7	0.0	47.0
LnGrp LOS	F	B	B	F	C	C	F		D	F		D
Approach Vol, veh/h	1744				2849		105				275	
Approach Delay, s/veh	18.8				31.4		448.6				1156.7	
Approach LOS	B				C		F				F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	2.0	105.0			45.0	8.2	108.8	45.0				
Change Period (Y+Rc), s	4.5	5.0			5.0	4.5	5.0	5.0				
Max Green Setting (Gmax), s	7.5	100.0			40.0	7.5	88.0	40.0				
Max Q Clear Time (g_c+19), s	19.5	31.0			42.0	4.9	66.4	42.0				
Green Ext Time (p_c), s	0.0	51.1			0.0	0.0	21.5	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	98.0											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	46	16	17	32	16	372	519	43	54	258	280
Future Volume (veh/h)	267	46	16	17	32	16	372	519	43	54	258	280
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.96	1.00		0.95	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1840	1900	1900	1900	1900	1863	1881	1900	1827	1863	1900
Adj Flow Rate, veh/h	354	0	0	19	36	11	423	590	46	61	293	304
Adj No. of Lanes	2	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	4	2	2	0	0	0	2	1	1	4	2	2
Cap, veh/h	515	272	0	25	48	15	470	1816	141	78	571	490
Arrive On Green	0.15	0.00	0.00	0.05	0.05	0.05	0.26	0.54	0.52	0.04	0.32	0.30
Sat Flow, veh/h	3480	1840	0	520	984	301	1774	3347	260	1740	1770	1520
Grp Volume(v), veh/h	354	0	0	66	0	0	423	314	322	61	293	304
Grp Sat Flow(s),veh/h/ln	1740	1840	0	1805	0	0	1774	1787	1820	1740	1770	1520
Q Serve(g_s), s	7.1	0.0	0.0	2.7	0.0	0.0	17.0	7.2	7.3	2.6	10.0	12.7
Cycle Q Clear(g_c), s	7.1	0.0	0.0	2.7	0.0	0.0	17.0	7.2	7.3	2.6	10.0	12.7
Prop In Lane	1.00		0.00	0.29		0.17	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	515	272	0	88	0	0	470	970	988	78	571	490
V/C Ratio(X)	0.69	0.00	0.00	0.75	0.00	0.00	0.90	0.32	0.33	0.78	0.51	0.62
Avail Cap(c_a), veh/h	1504	795	0	536	0	0	767	1532	1561	752	1517	1304
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	0.0	0.0	34.8	0.0	0.0	26.3	9.4	9.5	35.0	20.4	21.9
Incr Delay (d2), s/veh	0.6	0.0	0.0	4.8	0.0	0.0	5.4	0.3	0.3	6.3	1.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.0	1.5	0.0	0.0	9.1	3.6	3.7	1.4	5.0	5.5
LnGrp Delay(d),s/veh	30.5	0.0	0.0	39.6	0.0	0.0	31.7	9.7	9.7	41.3	21.4	23.8
LnGrp LOS	C			D			C	A	A	D	C	C
Approach Vol, veh/h	354		66			1059			658			
Approach Delay, s/veh	30.5		39.6			18.5			24.3			
Approach LOS	C		D			B			C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	44.2		15.0	23.6	27.9		7.6				
Change Period (Y+Rc), s	4.0	5.5		4.0	4.0	5.5		4.0				
Max Green Setting (Gmax), s	32.0	62.0		32.0	32.0	62.0		22.0				
Max Q Clear Time (g_c+I1), s	4.6	9.3		9.1	19.0	14.7		4.7				
Green Ext Time (p_c), s	0.1	6.8		0.7	0.6	6.6		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay	22.9											
HCM 2010 LOS	C											
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↰	↰	↱	↰	↰
Traffic Volume (veh/h)	51	26	125	82	4	218	12	656	50	37	257	1
Future Volume (veh/h)	51	26	125	82	4	218	12	656	50	37	257	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1795	1845	1863	1881	1900	1792	1845	1900
Adj Flow Rate, veh/h	59	30	82	94	5	113	14	754	52	43	295	1
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	3	3	3	2	1	1	6	3	3
Cap, veh/h	0	267	220	0	252	189	15	2274	156	48	1737	6
Arrive On Green	0.00	0.14	0.14	0.00	0.14	0.14	0.01	0.46	0.43	0.03	0.48	0.45
Sat Flow, veh/h	0	1900	1567	0	1795	1346	1774	4894	336	1707	3583	12
Grp Volume(v), veh/h	0	30	82	0	5	113	14	526	280	43	144	152
Grp Sat Flow(s),veh/h/ln	0	1900	1567	0	1795	1346	1774	1712	1806	1707	1752	1842
Q Serve(g_s), s	0.0	0.5	1.6	0.0	0.1	2.6	0.3	3.2	3.2	0.8	1.5	1.5
Cycle Q Clear(g_c), s	0.0	0.5	1.6	0.0	0.1	2.6	0.3	3.2	3.2	0.8	1.5	1.5
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.19	1.00		0.01
Lane Grp Cap(c), veh/h	0	267	220	0	252	189	15	1591	839	48	849	893
V/C Ratio(X)	0.00	0.11	0.37	0.00	0.02	0.60	0.95	0.33	0.33	0.89	0.17	0.17
Avail Cap(c_a), veh/h	0	1858	1532	0	2304	1728	1735	3452	1821	1669	1767	1858
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	12.3	12.8	0.0	12.1	13.2	16.2	5.5	5.6	15.8	4.7	4.7
Incr Delay (d2), s/veh	0.0	0.1	0.4	0.0	0.0	1.1	55.4	0.2	0.3	17.7	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.7	0.0	0.0	1.0	0.3	1.5	1.6	0.6	0.8	0.8
LnGrp Delay(d),s/veh	0.0	12.4	13.2	0.0	12.1	14.3	71.6	5.7	5.9	33.5	4.9	4.9
LnGrp LOS		B	B		B	B	E	A	A	C	A	A
Approach Vol, veh/h		112			118			820			339	
Approach Delay, s/veh		12.9			14.2			6.9			8.5	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.9	19.2	0.0	8.6	4.3	19.9	0.0	8.6				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	12.8	5.2	0.0	3.6	2.3	3.5	0.0	4.6				
Green Ext Time (p_c), s	0.0	8.1	0.0	0.2	0.0	2.6	0.0	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			8.4									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Existing PM

Intersection

Intersection Delay, s/veh 14.1

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	105	32	41	65	24	138	169	68	56	137	29
Future Vol, veh/h	22	105	32	41	65	24	138	169	68	56	137	29
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	0	0	0	6	3	3	0	0	0
Mvmt Flow	25	118	36	46	73	27	155	190	76	63	154	33
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	11.5	11.3	17.3	12.1
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	37%	100%	0%	32%	25%
Vol Thru, %	45%	0%	77%	50%	62%
Vol Right, %	18%	0%	23%	18%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	375	22	137	130	222
LT Vol	138	22	0	41	56
Through Vol	169	0	105	65	137
RT Vol	68	0	32	24	29
Lane Flow Rate	421	25	154	146	249
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.632	0.049	0.276	0.251	0.386
Departure Headway (Hd)	5.399	7.143	6.449	6.186	5.578
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	666	499	554	577	641
Service Time	3.455	4.915	4.221	4.263	3.645
HCM Lane V/C Ratio	0.632	0.05	0.278	0.253	0.388
HCM Control Delay	17.3	10.3	11.7	11.3	12.1
HCM Lane LOS	C	B	B	B	B
HCM 95th-tile Q	4.5	0.2	1.1	1	1.8

Intersection

Intersection Delay, s/veh 8.8

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	193	29	8	1	12	2	7	2	1	1	1	109
Future Vol, veh/h	193	29	8	1	12	2	7	2	1	1	1	109
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	219	33	9	1	14	2	8	2	1	1	1	124
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	9.4	7.5	8.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	84%	7%	1%
Vol Thru, %	0%	67%	13%	80%	1%
Vol Right, %	0%	33%	3%	13%	98%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	7	3	230	15	111
LT Vol	7	0	193	1	1
Through Vol	0	2	29	12	1
RT Vol	0	1	8	2	109
Lane Flow Rate	8	3	261	17	126
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.013	0.005	0.314	0.021	0.143
Departure Headway (Hd)	5.765	5.026	4.33	4.414	4.081
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	624	715	821	813	884
Service Time	3.472	2.733	2.41	2.428	2.083
HCM Lane V/C Ratio	0.013	0.004	0.318	0.021	0.143
HCM Control Delay	8.5	7.8	9.4	7.5	7.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0	0	1.3	0.1	0.5

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	33	207	92	106	157	58	507	43	53	389	40
Future Volume (veh/h)	62	33	207	92	106	157	58	507	43	53	389	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1900	1900	1900	1863	1881	1881	1827	1863	1900
Adj Flow Rate, veh/h	75	40	33	111	128	147	70	611	17	64	469	42
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	1	1	0	0	0	2	1	1	4	2	2
Cap, veh/h	234	257	183	429	188	216	90	1163	496	81	1050	94
Arrive On Green	0.13	0.13	0.13	0.24	0.24	0.24	0.05	0.33	0.33	0.05	0.32	0.30
Sat Flow, veh/h	1774	1950	1387	1810	795	913	1774	3574	1524	1740	3268	291
Grp Volume(v), veh/h	75	36	37	111	0	275	70	611	17	64	253	258
Grp Sat Flow(s),veh/h/ln	1774	1787	1550	1810	0	1708	1774	1787	1524	1740	1770	1789
Q Serve(g_s), s	2.4	1.1	1.3	3.1	0.0	9.0	2.4	8.6	0.5	2.2	7.0	7.1
Cycle Q Clear(g_c), s	2.4	1.1	1.3	3.1	0.0	9.0	2.4	8.6	0.5	2.2	7.0	7.1
Prop In Lane	1.00		0.89	1.00		0.53	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	234	235	204	429	0	405	90	1163	496	81	568	575
V/C Ratio(X)	0.32	0.15	0.18	0.26	0.00	0.68	0.78	0.53	0.03	0.79	0.45	0.45
Avail Cap(c_a), veh/h	748	754	654	763	0	720	633	1913	816	621	947	958
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	23.7	23.8	19.1	0.0	21.4	28.9	16.9	14.2	29.1	16.6	16.7
Incr Delay (d2), s/veh	0.3	0.1	0.2	0.1	0.0	0.8	5.4	0.5	0.0	6.3	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.5	0.6	1.6	0.0	4.3	1.3	4.2	0.2	1.2	3.5	3.6
LnGrp Delay(d),s/veh	24.6	23.8	24.0	19.2	0.0	22.1	34.3	17.5	14.2	35.4	17.4	17.5
LnGrp LOS	C	C	C	B		C	C	B	B	D	B	B
Approach Vol, veh/h	148		386			698			575			
Approach Delay, s/veh	24.2		21.3			19.1			19.4			
Approach LOS	C		C			B			B			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	24.1		12.1	7.1	23.8		18.6				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.6	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+I), s	14.2	10.6		4.4	4.4	9.1		11.0				
Green Ext Time (p_c), s	0.1	5.8		0.3	0.1	4.6		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			20.1									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh 13.7

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	143	265	0	8	35	232	0	6	8	156	17	36
Future Vol, veh/h	143	265	0	8	35	232	0	6	8	156	17	36
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	10	5	5	142	71	71	0	0	0
Mvmt Flow	164	305	0	9	40	267	0	7	9	179	20	41
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	14.1	12.1	11	15.1
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	75%
Vol Thru, %	43%	38%	100%	0%	100%	5%	8%
Vol Right, %	57%	0%	0%	0%	0%	95%	17%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	231	177	8	23	244	209
LT Vol	0	143	0	8	0	0	156
Through Vol	6	88	177	0	23	12	17
RT Vol	8	0	0	0	0	232	36
Lane Flow Rate	16	266	203	9	27	280	240
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.035	0.486	0.353	0.017	0.046	0.431	0.454
Departure Headway (Hd)	7.927	6.579	6.264	6.81	6.215	5.538	6.798
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	450	548	573	525	575	647	529
Service Time	5.706	4.332	4.018	4.564	3.969	3.291	4.551
HCM Lane V/C Ratio	0.036	0.485	0.354	0.017	0.047	0.433	0.454
HCM Control Delay	11	15.4	12.4	9.7	9.3	12.5	15.1
HCM Lane LOS	B	C	B	A	A	B	C
HCM 95th-tile Q	0.1	2.6	1.6	0.1	0.1	2.2	2.3

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↰↰↰	↰	↰	↰↰	↰			
Traffic Volume (veh/h)	510	1105	0	0	1566	625	77	184	517	0	0	0
Future Volume (veh/h)	510	1105	0	0	1566	625	77	184	517	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	526	1139	0	0	1614	0	79	190	0			
Adj No. of Lanes	2	2	0	0	3	1	1	2	1			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	566	3009	0	0	3342	1040	172	346	155			
Arrive On Green	0.16	0.84	0.00	0.00	1.00	0.00	0.10	0.10	0.00			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	3574	1599			
Grp Volume(v), veh/h	526	1139	0	0	1614	0	79	190	0			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1787	1599			
Q Serve(g_s), s	22.6	11.1	0.0	0.0	0.0	0.0	6.3	7.6	0.0			
Cycle Q Clear(g_c), s	22.6	11.1	0.0	0.0	0.0	0.0	6.3	7.6	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	566	3009	0	0	3342	1040	172	346	155			
V/C Ratio(X)	0.93	0.38	0.00	0.00	0.48	0.00	0.46	0.55	0.00			
Avail Cap(c_a), veh/h	574	3009	0	0	3342	1040	412	829	371			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.58	0.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh	61.8	2.8	0.0	0.0	0.0	0.0	64.0	64.6	0.0			
Incr Delay (d2), s/veh	21.2	0.4	0.0	0.0	0.3	0.0	0.7	0.5	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.4	5.5	0.0	0.0	0.1	0.0	3.1	3.8	0.0			
LnGrp Delay(d),s/veh	83.0	3.1	0.0	0.0	0.3	0.0	64.7	65.1	0.0			
LnGrp LOS	F	A			A		E	E				
Approach Vol, veh/h		1665			1614			269				
Approach Delay, s/veh		28.4			0.3			65.0				
Approach LOS		C			A			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		131.3			28.7	102.6		18.7				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		106.0			25.0	77.0		34.8				
Max Q Clear Time (g_c+I1), s		13.1			24.6	2.0		9.6				
Green Ext Time (p_c), s		36.3			0.1	51.8		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			18.4									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	   		 	  		 	 		 	 	
Traffic Volume (veh/h)	130	1338	155	136	1379	69	323	435	270	176	222	491
Future Volume (veh/h)	130	1338	155	136	1379	69	323	435	270	176	222	491
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.89	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	133	1365	158	139	1407	0	330	444	276	180	227	0
Adj No. of Lanes	2	4	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	177	2721	314	187	2381	612	373	899	357	189	893	400
Arrive On Green	0.10	0.92	0.92	0.05	0.46	0.00	0.11	0.25	0.25	0.11	0.25	0.00
Sat Flow, veh/h	3442	5905	681	3442	5136	1319	3442	3574	1420	1774	3574	1599
Grp Volume(v), veh/h	133	1121	402	139	1407	0	330	444	276	180	227	0
Grp Sat Flow(s),veh/h/ln	1721	1618	1733	1721	1712	1319	1721	1787	1420	1774	1787	1599
Q Serve(g_s), s	5.6	5.1	5.1	6.0	30.4	0.0	14.2	15.9	27.1	15.1	7.6	0.0
Cycle Q Clear(g_c), s	5.6	5.1	5.1	6.0	30.4	0.0	14.2	15.9	27.1	15.1	7.6	0.0
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	177	2236	798	187	2381	612	373	899	357	189	893	400
V/C Ratio(X)	0.75	0.50	0.50	0.74	0.59	0.00	0.89	0.49	0.77	0.95	0.25	0.00
Avail Cap(c_a), veh/h	252	2236	798	597	2381	612	390	929	369	189	905	405
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	0.74	0.74	0.00	1.00	1.00	1.00	0.89	0.89	0.00
Uniform Delay (d), s/veh	66.4	3.4	3.4	69.9	29.7	0.0	66.0	48.0	52.1	66.6	45.1	0.0
Incr Delay (d2), s/veh	5.2	0.6	1.5	1.6	0.8	0.0	19.4	0.2	8.5	47.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.2	2.6	2.9	14.5	0.0	7.7	7.9	11.4	9.9	3.8	0.0
LnGrp Delay(d),s/veh	71.5	3.9	4.9	71.5	30.5	0.0	85.3	48.1	60.6	114.2	45.1	0.0
LnGrp LOS	E	A	A	E	C		F	D	E	F	D	
Approach Vol, veh/h	1656					1546		1050		407		
Approach Delay, s/veh	9.6					34.2		63.1		75.6		
Approach LOS	A					C		E		E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.1	75.1	20.3	42.5	11.7	75.5	20.0	42.7				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.6	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+1.0), s	19.0	7.1	16.2	9.6	7.6	32.4	17.1	29.1				
Green Ext Time (p_c), s	0.2	31.7	0.1	1.0	0.1	24.6	0.0	1.9				
Intersection Summary												
HCM 2010 Ctrl Delay			35.6									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	1655	58	128	1412	306	101	34	450	354	38	81
Future Volume (veh/h)	59	1655	58	128	1412	306	101	34	450	354	38	81
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1866	1881
Adj Flow Rate, veh/h	62	1742	0	135	1486	0	106	36	271	402	0	16
Adj No. of Lanes	2	4	0	1	3	1	1	1	0	2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	127	2382	0	157	2154	671	395	41	305	665	0	278
Arrive On Green	0.01	0.12	0.00	0.09	0.42	0.00	0.22	0.22	0.22	0.19	0.00	0.19
Sat Flow, veh/h	3442	6735	0	1774	5136	1599	1774	182	1370	3548	0	1483
Grp Volume(v), veh/h	62	1742	0	135	1486	0	106	0	307	402	0	16
Grp Sat Flow(s),veh/h/ln	1721	1618	0	1774	1712	1599	1774	0	1552	1774	0	1483
Q Serve(g_s), s	2.7	38.9	0.0	11.3	35.5	0.0	7.4	0.0	28.7	15.6	0.0	1.3
Cycle Q Clear(g_c), s	2.7	38.9	0.0	11.3	35.5	0.0	7.4	0.0	28.7	15.6	0.0	1.3
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.88	1.00		1.00
Lane Grp Cap(c), veh/h	127	2382	0	157	2154	671	395	0	346	665	0	278
V/C Ratio(X)	0.49	0.73	0.00	0.86	0.69	0.00	0.27	0.00	0.89	0.60	0.00	0.06
Avail Cap(c_a), veh/h	184	2382	0	248	2154	671	414	0	362	852	0	356
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.00	0.86	0.86	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	72.7	58.7	0.0	67.5	35.6	0.0	48.2	0.0	56.5	55.8	0.0	50.0
Incr Delay (d2), s/veh	0.9	1.6	0.0	8.7	1.6	0.0	0.1	0.0	21.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	17.7	0.0	5.9	17.1	0.0	3.6	0.0	14.4	7.7	0.0	0.5
LnGrp Delay(d),s/veh	73.5	60.3	0.0	76.1	37.2	0.0	48.3	0.0	77.5	56.2	0.0	50.1
LnGrp LOS	E	E		E	D		D		E	E		D
Approach Vol, veh/h	1804				1621				413		418	
Approach Delay, s/veh	60.8				40.4				70.0		55.9	
Approach LOS	E				D				E		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	7.2	61.2			33.1	9.5	68.9	38.4				
Change Period (Y+Rc), s	4.0	6.0			5.0	4.0	6.0	5.0				
Max Green Setting (Gmax), s	21.0	38.0			36.0	8.0	51.0	35.0				
Max Q Clear Time (g_c+1/3), s	11.3	40.9			17.6	4.7	37.5	30.7				
Green Ext Time (p_c), s	0.0	0.0			0.8	0.0	11.9	0.7				
Intersection Summary												
HCM 2010 Ctrl Delay			53.4									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	2398	57	68	1559	30	178	47	367	38	14	33
Future Volume (veh/h)	86	2398	57	68	1559	30	178	47	367	38	14	33
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	90	2498	59	71	1624	31	185	49	382	40	15	34
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	0	0	0	0	0	0
Cap, veh/h	82	3170	951	82	3200	61	40	0	396	38	9	353
Arrive On Green	0.05	0.62	0.62	0.05	0.62	0.62	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1540	1774	5184	99	0	0	1605	0	36	1429
Grp Volume(v), veh/h	90	2498	59	71	1072	583	234	0	382	55	0	34
Grp Sat Flow(s),veh/h/ln	1774	1712	1540	1774	1712	1860	0	0	1605	36	0	1429
Q Serve(g_s), s	7.5	58.7	2.5	6.4	28.3	28.3	0.0	0.0	38.1	0.0	0.0	3.0
Cycle Q Clear(g_c), s	7.5	58.7	2.5	6.4	28.3	28.3	40.0	0.0	38.1	40.0	0.0	3.0
Prop In Lane	1.00		1.00	1.00		0.05	0.79		1.00	0.73		1.00
Lane Grp Cap(c), veh/h	82	3170	951	82	2113	1148	40	0	396	47	0	353
V/C Ratio(X)	1.10	0.79	0.06	0.86	0.51	0.51	5.88	0.00	0.96	1.17	0.00	0.10
Avail Cap(c_a), veh/h	82	3170	951	82	2113	1148	40	0	396	47	0	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.56	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	77.3	23.1	12.3	76.7	17.3	17.3	81.0	0.0	60.3	73.6	0.0	47.1
Incr Delay (d2), s/veh	102.4	1.2	0.1	55.1	0.9	1.6	2249.5	0.0	35.5	183.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	27.9	1.1	4.4	13.5	14.9	26.6	0.0	20.8	4.5	0.0	1.2
LnGrp Delay(d),s/veh	180.0	24.3	12.4	131.9	18.1	18.9	2330.5	0.0	95.8	258.0	0.0	47.1
LnGrp LOS	F	C	B	F	B	B	F		F	F		D
Approach Vol, veh/h	2647			1726			616			89		
Approach Delay, s/veh	29.3			23.1			944.7			177.4		
Approach LOS	C			C			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	105.0		45.0	12.0	105.0		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	5	100.0		40.0	7.5	88.0		40.0				
Max Q Clear Time (g_c+1/4), s	13.4	60.7		42.0	9.5	30.3		42.0				
Green Ext Time (p_c), s	0.0	38.4		0.0	0.0	43.4		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	140.8											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	12	39	39	25	20	198	172	13	53	1011	298
Future Volume (veh/h)	134	12	39	39	25	20	198	172	13	53	1011	298
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1847	1900	1900	1846	1900	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	95	91	26	44	28	15	222	193	13	60	1136	322
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	180	143	41	57	36	19	255	2125	142	77	1443	404
Arrive On Green	0.10	0.10	0.10	0.06	0.06	0.06	0.15	0.63	0.62	0.04	0.53	0.52
Sat Flow, veh/h	1740	1375	393	884	563	301	1740	3354	224	1740	2716	759
Grp Volume(v), veh/h	95	0	117	87	0	0	222	101	105	60	735	723
Grp Sat Flow(s),veh/h/ln	1740	0	1768	1748	0	0	1740	1770	1809	1740	1770	1706
Q Serve(g_s), s	5.4	0.0	6.6	5.1	0.0	0.0	13.0	2.3	2.4	3.6	34.6	36.1
Cycle Q Clear(g_c), s	5.4	0.0	6.6	5.1	0.0	0.0	13.0	2.3	2.4	3.6	34.6	36.1
Prop In Lane	1.00		0.22	0.51		0.17	1.00		0.12	1.00		0.45
Lane Grp Cap(c), veh/h	180	0	183	113	0	0	255	1121	1146	77	940	907
V/C Ratio(X)	0.53	0.00	0.64	0.77	0.00	0.00	0.87	0.09	0.09	0.78	0.78	0.80
Avail Cap(c_a), veh/h	535	0	544	370	0	0	535	1121	1146	535	1080	1041
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	0.0	44.7	47.9	0.0	0.0	43.4	7.4	7.5	49.2	19.5	20.1
Incr Delay (d2), s/veh	0.9	0.0	1.4	4.1	0.0	0.0	3.6	0.0	0.0	6.1	3.7	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	3.3	2.6	0.0	0.0	6.5	1.1	1.2	1.8	17.7	18.0
LnGrp Delay(d),s/veh	45.1	0.0	46.1	52.0	0.0	0.0	47.0	7.5	7.5	55.3	23.2	24.5
LnGrp LOS	D		D	D			D	A	A	E	C	C
Approach Vol, veh/h		212			87			428			1518	
Approach Delay, s/veh		45.7			52.0			28.0			25.1	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	69.9		14.8	19.2	59.3		10.7				
Change Period (Y+Rc), s	4.0	5.5		4.0	4.0	5.5		4.0				
Max Green Setting (Gmax), s	32.0	62.0		32.0	32.0	62.0		22.0				
Max Q Clear Time (g_c+I1), s	5.6	4.4		8.6	15.0	38.1		7.1				
Green Ext Time (p_c), s	0.1	1.9		0.5	0.3	15.7		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			28.6									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Existing Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↘		↗	↘	↗	↑↑↑		↗	↑↑	
Traffic Volume (veh/h)	4	0	5	176	25	159	23	235	41	105	901	93
Future Volume (veh/h)	4	0	5	176	25	159	23	235	41	105	901	93
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1831	1863	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	4	0	3	193	27	71	25	258	30	115	990	98
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	0	235	196	0	235	172	27	2236	252	149	1799	178
Arrive On Green	0.00	0.00	0.13	0.00	0.13	0.13	0.02	0.49	0.46	0.09	0.55	0.53
Sat Flow, veh/h	0	1827	1528	0	1831	1339	1740	4610	519	1740	3243	321
Grp Volume(v), veh/h	0	0	3	0	27	71	25	188	100	115	540	548
Grp Sat Flow(s),veh/h/ln	0	1827	1528	0	1831	1339	1740	1695	1739	1740	1770	1794
Q Serve(g_s), s	0.0	0.0	0.1	0.0	0.5	1.9	0.6	1.2	1.3	2.6	7.8	7.9
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.0	0.5	1.9	0.6	1.2	1.3	2.6	7.8	7.9
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.30	1.00		0.18
Lane Grp Cap(c), veh/h	0	235	196	0	235	172	27	1644	844	149	982	996
V/C Ratio(X)	0.00	0.00	0.02	0.00	0.11	0.41	0.91	0.11	0.12	0.77	0.55	0.55
Avail Cap(c_a), veh/h	0	1466	1226	0	1929	1411	1397	2806	1440	1397	1465	1485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	15.2	0.0	15.4	16.0	19.6	5.6	5.7	17.9	5.7	5.8
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.1	0.6	31.1	0.0	0.1	3.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	0.0	0.3	0.7	0.5	0.6	0.6	1.3	3.9	4.0
LnGrp Delay(d),s/veh	0.0	0.0	15.2	0.0	15.4	16.6	50.7	5.6	5.8	21.1	6.4	6.4
LnGrp LOS			B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		3			98			313			1203	
Approach Delay, s/veh		15.2			16.3			9.3			7.8	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.4	23.3	0.0	9.1	4.6	26.1	0.0	9.1				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax)	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I)	14.6	3.3	0.0	2.1	2.6	9.9	0.0	3.9				
Green Ext Time (p_c), s	0.2	2.6	0.0	0.0	0.0	11.0	0.0	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			8.6									
HCM 2010 LOS			A									

Intersection

Intersection Delay, s/veh 24.1

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	51	37	142	215	35	95	61	54	56	241	53
Future Vol, veh/h	17	51	37	142	215	35	95	61	54	56	241	53
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	19	58	42	161	244	40	108	69	61	64	274	60
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	12	31.8	15.5	24.2
HCM LOS	B	D	C	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	45%	100%	0%	36%	16%
Vol Thru, %	29%	0%	58%	55%	69%
Vol Right, %	26%	0%	42%	9%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	210	17	88	392	350
LT Vol	95	17	0	142	56
Through Vol	61	0	51	215	241
RT Vol	54	0	37	35	53
Lane Flow Rate	239	19	100	445	398
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.453	0.044	0.206	0.809	0.714
Departure Headway (Hd)	6.835	8.28	7.409	6.538	6.462
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	525	430	482	552	557
Service Time	4.913	6.07	5.199	4.602	4.528
HCM Lane V/C Ratio	0.455	0.044	0.207	0.806	0.715
HCM Control Delay	15.5	11.5	12.1	31.8	24.2
HCM Lane LOS	C	B	B	D	C
HCM 95th-tile Q	2.3	0.1	0.8	7.9	5.8

Intersection

Intersection Delay, s/veh 9.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	112	19	29	0	25	4	79	21	1	5	9	288
Future Vol, veh/h	112	19	29	0	25	4	79	21	1	5	9	288
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	1	1	2	1	1	2	1	1	2	1	1
Mvmt Flow	123	21	32	0	27	4	87	23	1	5	10	316
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	9.7	8.4	9.3	9.8
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	70%	0%	2%
Vol Thru, %	0%	95%	12%	86%	3%
Vol Right, %	0%	5%	18%	14%	95%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	79	22	160	29	302
LT Vol	79	0	112	0	5
Through Vol	0	21	19	25	9
RT Vol	0	1	29	4	288
Lane Flow Rate	87	24	176	32	332
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.141	0.035	0.244	0.045	0.383
Departure Headway (Hd)	5.837	5.284	4.992	5.073	4.151
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	613	675	716	700	863
Service Time	3.589	3.035	3.047	3.144	2.189
HCM Lane V/C Ratio	0.142	0.036	0.246	0.046	0.385
HCM Control Delay	9.6	8.2	9.7	8.4	9.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.5	0.1	1	0.1	1.8

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Existing Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	41	39	65	46	45	71	222	39	111	763	207
Future Volume (veh/h)	35	41	39	65	46	45	71	222	39	111	763	207
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.92	1.00		0.92	1.00		0.94	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1900	1863	1881	1881	1863	1881	1900
Adj Flow Rate, veh/h	38	45	6	71	50	19	77	241	18	121	829	210
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	259	460	59	279	199	76	100	1333	562	156	1135	288
Arrive On Green	0.15	0.15	0.15	0.16	0.16	0.16	0.06	0.37	0.37	0.09	0.40	0.39
Sat Flow, veh/h	1774	3149	407	1774	1266	481	1774	3574	1507	1774	2805	710
Grp Volume(v), veh/h	38	25	26	71	0	69	77	241	18	121	528	511
Grp Sat Flow(s),veh/h/ln	1774	1787	1769	1774	0	1747	1774	1787	1507	1774	1787	1728
Q Serve(g_s), s	1.3	0.8	0.9	2.4	0.0	2.4	2.9	3.1	0.5	4.5	17.0	17.0
Cycle Q Clear(g_c), s	1.3	0.8	0.9	2.4	0.0	2.4	2.9	3.1	0.5	4.5	17.0	17.0
Prop In Lane	1.00		0.23	1.00		0.28	1.00		1.00	1.00		0.41
Lane Grp Cap(c), veh/h	259	261	258	279	0	275	100	1333	562	156	723	700
V/C Ratio(X)	0.15	0.10	0.10	0.25	0.00	0.25	0.77	0.18	0.03	0.77	0.73	0.73
Avail Cap(c_a), veh/h	679	684	677	679	0	669	575	1736	732	575	868	840
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	25.1	25.1	25.1	0.0	25.1	31.6	14.3	13.5	30.3	17.1	17.3
Incr Delay (d2), s/veh	0.1	0.1	0.1	0.2	0.0	0.2	4.7	0.1	0.0	3.1	3.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.4	0.4	1.2	0.0	1.1	1.6	1.5	0.2	2.4	9.0	8.7
LnGrp Delay(d),s/veh	25.4	25.2	25.2	25.3	0.0	25.3	36.3	14.4	13.6	33.4	20.1	20.4
LnGrp LOS	C	C	C	C		C	D	B	B	C	C	C
Approach Vol, veh/h	89			140			336			1160		
Approach Delay, s/veh	25.3			25.3			19.4			21.6		
Approach LOS	C			C			B			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	29.3		13.9	7.8	31.5		14.7				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+I), s	10.5	5.1		3.3	4.9	19.0		4.4				
Green Ext Time (p_c), s	0.1	2.3		0.2	0.1	7.5		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	21.7											
HCM 2010 LOS	C											

Intersection

Intersection Delay, s/veh 21.5

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	21	41	1	6	154	158	0	4	6	313	8	139
Future Vol, veh/h	21	41	1	6	154	158	0	4	6	313	8	139
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	23	45	1	7	167	172	0	4	7	340	9	151
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	10.8	11.4	9	30.3
HCM LOS	B	B	A	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	51%	0%	100%	0%	0%	68%
Vol Thru, %	40%	49%	95%	0%	100%	25%	2%
Vol Right, %	60%	0%	5%	0%	0%	75%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	42	22	6	103	209	460
LT Vol	0	21	0	6	0	0	313
Through Vol	4	21	21	0	103	51	8
RT Vol	6	0	1	0	0	158	139
Lane Flow Rate	11	45	23	7	112	228	500
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.018	0.094	0.046	0.012	0.196	0.366	0.822
Departure Headway (Hd)	6.099	7.504	7.158	6.888	6.327	5.789	5.917
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	586	477	499	520	567	621	615
Service Time	3.85	5.262	4.916	4.63	4.069	3.531	3.643
HCM Lane V/C Ratio	0.019	0.094	0.046	0.013	0.198	0.367	0.813
HCM Control Delay	9	11	10.3	9.7	10.6	11.9	30.3
HCM Lane LOS	A	B	B	A	B	B	D
HCM 95th-tile Q	0.1	0.3	0.1	0	0.7	1.7	8.5

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	378	934	0	0	1607	576	153	533	992	0	0	0
Future Volume (veh/h)	378	934	0	0	1607	576	153	533	992	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	394	973	0	0	1674	0	159	555	0			
Adj No. of Lanes	2	2	0	0	3	1	1	2	1			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	444	2710	0	0	3095	964	320	645	288			
Arrive On Green	0.13	0.76	0.00	0.00	1.00	0.00	0.18	0.18	0.00			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	3574	1599			
Grp Volume(v), veh/h	394	973	0	0	1674	0	159	555	0			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1787	1599			
Q Serve(g_s), s	16.9	13.6	0.0	0.0	0.0	0.0	12.1	22.6	0.0			
Cycle Q Clear(g_c), s	16.9	13.6	0.0	0.0	0.0	0.0	12.1	22.6	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	444	2710	0	0	3095	964	320	645	288			
V/C Ratio(X)	0.89	0.36	0.00	0.00	0.54	0.00	0.50	0.86	0.00			
Avail Cap(c_a), veh/h	574	2710	0	0	3095	964	412	829	371			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.60	0.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh	64.3	6.0	0.0	0.0	0.0	0.0	55.3	59.6	0.0			
Incr Delay (d2), s/veh	11.2	0.4	0.0	0.0	0.4	0.0	0.4	6.2	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.7	6.8	0.0	0.0	0.1	0.0	6.0	11.7	0.0			
LnGrp Delay(d),s/veh	75.4	6.4	0.0	0.0	0.4	0.0	55.8	65.8	0.0			
LnGrp LOS	E	A			A		E	E				
Approach Vol, veh/h		1367			1674			714				
Approach Delay, s/veh		26.3			0.4			63.6				
Approach LOS		C			A			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		118.7			23.3	95.4		31.3				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		106.0			25.0	77.0		34.8				
Max Q Clear Time (g_c+I1), s		15.6			18.9	2.0		24.6				
Green Ext Time (p_c), s		27.4			0.4	54.0		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay					21.8							
HCM 2010 LOS					C							

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Existing Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	149	1479	294	394	1743	76	230	209	41	75	568	222
Future Volume (veh/h)	149	1479	294	394	1743	76	230	209	41	75	568	222
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.85	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	154	1525	281	406	1797	0	237	215	12	77	586	0
Adj No. of Lanes	2	4	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	198	2250	414	456	2482	638	284	995	379	96	894	400
Arrive On Green	0.11	0.82	0.82	0.13	0.48	0.00	0.08	0.28	0.28	0.05	0.25	0.00
Sat Flow, veh/h	3442	5513	1015	3442	5136	1319	3442	3574	1361	1774	3574	1599
Grp Volume(v), veh/h	154	1342	464	406	1797	0	237	215	12	77	586	0
Grp Sat Flow(s),veh/h/ln	1721	1618	1675	1721	1712	1319	1721	1787	1361	1774	1787	1599
Q Serve(g_s), s	6.5	17.1	17.1	17.4	41.7	0.0	10.2	6.9	1.0	6.4	22.1	0.0
Cycle Q Clear(g_c), s	6.5	17.1	17.1	17.4	41.7	0.0	10.2	6.9	1.0	6.4	22.1	0.0
Prop In Lane	1.00		0.61	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1981	684	456	2482	638	284	995	379	96	894	400
V/C Ratio(X)	0.78	0.68	0.68	0.89	0.72	0.00	0.83	0.22	0.03	0.80	0.66	0.00
Avail Cap(c_a), veh/h	252	1981	684	597	2482	638	390	995	379	189	905	405
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	0.30	0.30	0.00	1.00	1.00	1.00	0.70	0.70	0.00
Uniform Delay (d), s/veh	65.5	9.7	9.7	64.0	30.8	0.0	67.8	41.6	39.4	70.1	50.4	0.0
Incr Delay (d2), s/veh	1.1	0.2	0.5	3.7	0.6	0.0	8.1	0.0	0.0	4.0	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	7.2	7.6	8.5	19.8	0.0	5.2	3.4	0.4	3.3	11.0	0.0
LnGrp Delay(d),s/veh	66.6	9.9	10.2	67.7	31.4	0.0	75.9	41.6	39.4	74.1	51.4	0.0
LnGrp LOS	E	A	B	E	C		E	D	D	E	D	
Approach Vol, veh/h	1960				2203				464		663	
Approach Delay, s/veh	14.4				38.1				59.0		54.0	
Approach LOS	B				D				E		D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.9	67.2	16.4	42.5	12.6	78.5	12.1	46.8				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.6	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+1/4), s	19.4	19.1	12.2	24.1	8.5	43.7	8.4	8.9				
Green Ext Time (p_c), s	0.5	27.1	0.2	2.3	0.1	19.5	0.0	0.9				
Intersection Summary												
HCM 2010 Ctrl Delay			33.1									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Existing Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	   		 	  		 	 		 	 	
Traffic Volume (veh/h)	64	1375	151	231	2022	394	31	24	147	245	70	69
Future Volume (veh/h)	64	1375	151	231	2022	394	31	24	147	245	70	69
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.93	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1871	1881
Adj Flow Rate, veh/h	67	1432	0	241	2106	0	32	25	29	164	200	31
Adj No. of Lanes	2	4	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	129	2554	0	248	2553	795	239	103	119	350	369	288
Arrive On Green	0.01	0.13	0.00	0.14	0.50	0.00	0.13	0.13	0.13	0.20	0.20	0.20
Sat Flow, veh/h	3442	6735	0	1774	5136	1599	1774	763	885	1774	1871	1459
Grp Volume(v), veh/h	67	1432	0	241	2106	0	32	0	54	164	200	31
Grp Sat Flow(s),veh/h/ln	1721	1618	0	1774	1712	1599	1774	0	1648	1774	1871	1459
Q Serve(g_s), s	2.9	31.1	0.0	20.3	52.4	0.0	2.4	0.0	4.4	12.3	14.4	2.6
Cycle Q Clear(g_c), s	2.9	31.1	0.0	20.3	52.4	0.0	2.4	0.0	4.4	12.3	14.4	2.6
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	129	2554	0	248	2553	795	239	0	222	350	369	288
V/C Ratio(X)	0.52	0.56	0.00	0.97	0.82	0.00	0.13	0.00	0.24	0.47	0.54	0.11
Avail Cap(c_a), veh/h	184	2554	0	248	2553	795	414	0	385	426	449	350
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.00	0.54	0.54	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.7	53.0	0.0	64.2	32.2	0.0	57.2	0.0	58.0	53.3	54.1	49.4
Incr Delay (d2), s/veh	0.7	0.5	0.0	34.2	1.8	0.0	0.1	0.0	0.2	0.4	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	14.1	0.0	12.3	25.2	0.0	1.2	0.0	2.0	6.0	7.5	1.1
LnGrp Delay(d),s/veh	73.4	53.6	0.0	98.4	33.9	0.0	57.3	0.0	58.3	53.6	54.6	49.4
LnGrp LOS	E	D		F	C		E		E	D	D	D
Approach Vol, veh/h		1499			2347			86			395	
Approach Delay, s/veh		54.4			40.5			57.9			53.8	
Approach LOS		D			D			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	65.2		34.6	9.6	80.6		25.2				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	21.0	38.0		36.0	8.0	51.0		35.0				
Max Q Clear Time (g_c+2.35), s	22.3	33.1		16.4	4.9	54.4		6.4				
Green Ext Time (p_c), s	0.0	4.5		1.0	0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			46.9									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Existing Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1568	104	82	2592	39	51	39	53	71	168	64
Future Volume (veh/h)	30	1568	104	82	2592	39	51	39	53	71	168	64
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.95	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1871	1881	1900	1876	1881
Adj Flow Rate, veh/h	32	1651	73	86	2728	40	54	41	13	75	177	31
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	41	3170	957	82	3338	49	35	18	390	29	33	347
Arrive On Green	0.02	0.62	0.62	0.05	0.64	0.64	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1550	1774	5211	76	0	71	1578	0	134	1404
Grp Volume(v), veh/h	32	1651	73	86	1788	980	95	0	13	252	0	31
Grp Sat Flow(s),veh/h/ln	1774	1712	1550	1774	1712	1864	71	0	1578	134	0	1404
Q Serve(g_s), s	2.9	29.4	3.1	7.5	63.6	64.7	0.0	0.0	1.0	0.0	0.0	2.8
Cycle Q Clear(g_c), s	2.9	29.4	3.1	7.5	63.6	64.7	40.0	0.0	1.0	40.0	0.0	2.8
Prop In Lane	1.00		1.00	1.00		0.04	0.57		1.00	0.30		1.00
Lane Grp Cap(c), veh/h	41	3170	957	82	2193	1193	52	0	390	62	0	347
V/C Ratio(X)	0.78	0.52	0.08	1.05	0.82	0.82	1.81	0.00	0.03	4.08	0.00	0.09
Avail Cap(c_a), veh/h	82	3170	957	82	2193	1193	52	0	390	62	0	347
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.7	17.5	12.5	77.3	21.9	22.1	67.9	0.0	46.3	60.4	0.0	47.0
Incr Delay (d2), s/veh	6.9	0.4	0.1	112.8	3.5	6.4	431.1	0.0	0.0	1421.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	13.9	1.3	6.2	30.9	35.1	8.6	0.0	0.4	27.2	0.0	1.1
LnGrp Delay(d),s/veh	85.6	17.9	12.5	191.0	25.4	28.5	498.9	0.0	46.3	1481.7	0.0	47.0
LnGrp LOS	F	B	B	F	C	C	F		D	F		D
Approach Vol, veh/h	1756			2854			108			283		
Approach Delay, s/veh	18.9			31.5			444.4			1324.6		
Approach LOS	B			C			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	105.0		45.0	8.2	108.8		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	5	100.0		40.0	7.5	88.0		40.0				
Max Q Clear Time (g_c+I), s	19.5	31.4		42.0	4.9	66.7		42.0				
Green Ext Time (p_c), s	0.0	51.3		0.0	0.0	21.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	109.1											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	267	46	22	17	32	16	380	524	43	54	267	280
Future Volume (veh/h)	267	46	22	17	32	16	380	524	43	54	267	280
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.96	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1841	1900	1900	1900	1900	1863	1881	1900	1827	1863	1900
Adj Flow Rate, veh/h	188	213	22	19	36	11	432	595	46	61	303	181
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	4	2	2	0	0	0	2	1	1	4	2	2
Cap, veh/h	313	295	31	25	48	15	481	1684	130	78	587	339
Arrive On Green	0.18	0.18	0.18	0.05	0.05	0.05	0.27	0.50	0.48	0.04	0.28	0.26
Sat Flow, veh/h	1740	1640	169	520	984	301	1774	3349	258	1740	2120	1225
Grp Volume(v), veh/h	188	0	235	66	0	0	432	317	324	61	251	233
Grp Sat Flow(s),veh/h/ln	1740	0	1809	1805	0	0	1774	1787	1820	1740	1770	1576
Q Serve(g_s), s	7.1	0.0	8.7	2.6	0.0	0.0	16.8	7.7	7.7	2.5	8.6	9.1
Cycle Q Clear(g_c), s	7.1	0.0	8.7	2.6	0.0	0.0	16.8	7.7	7.7	2.5	8.6	9.1
Prop In Lane	1.00		0.09	0.29		0.17	1.00		0.14	1.00		0.78
Lane Grp Cap(c), veh/h	313	0	326	87	0	0	481	899	915	78	490	436
V/C Ratio(X)	0.60	0.00	0.72	0.75	0.00	0.00	0.90	0.35	0.35	0.78	0.51	0.53
Avail Cap(c_a), veh/h	779	0	810	556	0	0	794	1588	1617	779	1572	1400
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	0.0	27.6	33.6	0.0	0.0	25.1	10.7	10.8	33.8	21.8	22.5
Incr Delay (d2), s/veh	0.7	0.0	1.1	4.9	0.0	0.0	4.8	0.3	0.3	6.4	1.2	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	4.5	1.4	0.0	0.0	8.8	3.9	4.0	1.3	4.3	4.1
LnGrp Delay(d),s/veh	27.6	0.0	28.7	38.5	0.0	0.0	30.0	11.1	11.1	40.2	23.0	23.9
LnGrp LOS	C		C	D			C	B	B	D	C	C
Approach Vol, veh/h		423			66			1073			545	
Approach Delay, s/veh		28.2			38.5			18.7			25.3	
Approach LOS		C			D			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	39.9		16.9	23.4	23.8		7.5				
Change Period (Y+Rc), s	4.0	5.5		4.0	4.0	5.5		4.0				
Max Green Setting (Gmax), s	32.0	62.0		32.0	32.0	62.0		22.0				
Max Q Clear Time (g_c+l1), s	4.5	9.7		10.7	18.8	11.1		4.6				
Green Ext Time (p_c), s	0.1	6.9		1.2	0.6	5.1		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				22.9								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Existing Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩		↩	↩	↩	↩		↩	↩	
Traffic Volume (veh/h)	51	26	125	85	4	231	12	656	58	52	257	1
Future Volume (veh/h)	51	26	125	85	4	231	12	656	58	52	257	1
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1795	1845	1863	1881	1900	1792	1845	1900
Adj Flow Rate, veh/h	59	30	78	98	5	115	14	754	61	60	295	1
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	3	3	3	2	1	1	6	3	3
Cap, veh/h	0	270	223	0	255	191	15	2222	179	71	1767	6
Arrive On Green	0.00	0.14	0.14	0.00	0.14	0.14	0.01	0.46	0.43	0.04	0.49	0.46
Sat Flow, veh/h	0	1900	1567	0	1795	1347	1774	4830	388	1707	3583	12
Grp Volume(v), veh/h	0	30	78	0	5	115	14	533	282	60	144	152
Grp Sat Flow(s),veh/h/ln	0	1900	1567	0	1795	1347	1774	1712	1794	1707	1752	1842
Q Serve(g_s), s	0.0	0.5	1.5	0.0	0.1	2.7	0.3	3.4	3.4	1.2	1.5	1.5
Cycle Q Clear(g_c), s	0.0	0.5	1.5	0.0	0.1	2.7	0.3	3.4	3.4	1.2	1.5	1.5
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.22	1.00		0.01
Lane Grp Cap(c), veh/h	0	270	223	0	255	191	15	1575	826	71	864	909
V/C Ratio(X)	0.00	0.11	0.35	0.00	0.02	0.60	0.95	0.34	0.34	0.85	0.17	0.17
Avail Cap(c_a), veh/h	0	1806	1490	0	2239	1680	1686	3356	1759	1623	1718	1806
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	12.6	13.0	0.0	12.4	13.5	16.7	5.8	5.9	16.0	4.7	4.7
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.0	0.0	1.1	55.0	0.2	0.3	10.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.7	0.0	0.0	1.0	0.3	1.6	1.7	0.7	0.8	0.8
LnGrp Delay(d),s/veh	0.0	12.7	13.4	0.0	12.4	14.7	71.7	6.0	6.2	26.1	4.8	4.8
LnGrp LOS		B	B		B	B	E	A	A	C	A	A
Approach Vol, veh/h		108			120			829			356	
Approach Delay, s/veh		13.2			14.6			7.2			8.4	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	19.5	0.0	8.8	4.3	20.6	0.0	8.8				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	13.2	5.4	0.0	3.5	2.3	3.5	0.0	4.7				
Green Ext Time (p_c), s	0.1	8.2	0.0	0.2	0.0	2.6	0.0	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			8.6									
HCM 2010 LOS			A									

Intersection

Intersection Delay, s/veh 17.4

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	22	132	32	60	81	29	138	169	96	60	137	29
Future Vol, veh/h	22	132	32	60	81	29	138	169	96	60	137	29
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	0	0	0	6	3	3	0	0	0
Mvmt Flow	25	148	36	67	91	33	155	190	108	67	154	33
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	13.1	13.3	23.2	13.8
HCM LOS	B	B	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	34%	100%	0%	35%	27%
Vol Thru, %	42%	0%	80%	48%	61%
Vol Right, %	24%	0%	20%	17%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	403	22	164	170	226
LT Vol	138	22	0	60	60
Through Vol	169	0	132	81	137
RT Vol	96	0	32	29	29
Lane Flow Rate	453	25	184	191	254
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.734	0.052	0.354	0.352	0.432
Departure Headway (Hd)	5.832	7.577	6.908	6.629	6.12
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	625	472	520	541	587
Service Time	3.832	5.335	4.666	4.689	4.172
HCM Lane V/C Ratio	0.725	0.053	0.354	0.353	0.433
HCM Control Delay	23.2	10.8	13.4	13.3	13.8
HCM Lane LOS	C	B	B	B	B
HCM 95th-tile Q	6.3	0.2	1.6	1.6	2.2

Intersection

Intersection Delay, s/veh 9.8

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	193	29	67	1	12	2	47	13	1	1	21	109
Future Vol, veh/h	193	29	67	1	12	2	47	13	1	1	21	109
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	219	33	76	1	14	2	53	15	1	1	24	124
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.6	7.9	9.1	8.4
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	67%	7%	1%
Vol Thru, %	0%	93%	10%	80%	16%
Vol Right, %	0%	7%	23%	13%	83%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	47	14	289	15	131
LT Vol	47	0	193	1	1
Through Vol	0	13	29	12	21
RT Vol	0	1	67	2	109
Lane Flow Rate	53	16	328	17	149
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.088	0.024	0.408	0.022	0.183
Departure Headway (Hd)	5.96	5.405	4.475	4.743	4.417
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	600	661	805	752	811
Service Time	3.703	3.147	2.504	2.789	2.453
HCM Lane V/C Ratio	0.088	0.024	0.407	0.023	0.184
HCM Control Delay	9.3	8.3	10.6	7.9	8.4
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0.3	0.1	2	0.1	0.7

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Existing Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	36	207	92	106	157	58	515	44	53	392	40
Future Volume (veh/h)	62	36	207	92	106	157	58	515	44	53	392	40
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.97	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1900	1900	1900	1863	1881	1881	1827	1863	1900
Adj Flow Rate, veh/h	75	43	33	111	128	147	70	620	17	64	472	43
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	1	1	0	0	0	2	1	1	4	2	2
Cap, veh/h	234	265	177	428	188	216	90	1168	498	81	1053	95
Arrive On Green	0.13	0.13	0.13	0.24	0.24	0.24	0.05	0.33	0.33	0.05	0.32	0.31
Sat Flow, veh/h	1774	2007	1342	1810	795	913	1774	3574	1525	1740	3262	296
Grp Volume(v), veh/h	75	38	38	111	0	275	70	620	17	64	255	260
Grp Sat Flow(s),veh/h/ln	1774	1787	1561	1810	0	1708	1774	1787	1525	1740	1770	1788
Q Serve(g_s), s	2.4	1.2	1.4	3.1	0.0	9.1	2.4	8.8	0.5	2.3	7.1	7.2
Cycle Q Clear(g_c), s	2.4	1.2	1.4	3.1	0.0	9.1	2.4	8.8	0.5	2.3	7.1	7.2
Prop In Lane	1.00		0.86	1.00		0.53	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	234	236	206	428	0	404	90	1168	498	81	571	577
V/C Ratio(X)	0.32	0.16	0.19	0.26	0.00	0.68	0.78	0.53	0.03	0.79	0.45	0.45
Avail Cap(c_a), veh/h	744	750	655	759	0	717	630	1903	812	618	942	952
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	23.9	23.9	19.2	0.0	21.5	29.1	17.0	14.2	29.2	16.6	16.7
Incr Delay (d2), s/veh	0.3	0.1	0.2	0.1	0.0	0.8	5.4	0.5	0.0	6.3	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.6	0.6	1.6	0.0	4.4	1.3	4.4	0.2	1.2	3.5	3.6
LnGrp Delay(d),s/veh	24.7	24.0	24.1	19.4	0.0	22.3	34.5	17.5	14.2	35.6	17.4	17.5
LnGrp LOS	C	C	C	B		C	C	B	B	D	B	B
Approach Vol, veh/h		151			386			707			579	
Approach Delay, s/veh		24.4			21.4			19.1			19.4	
Approach LOS		C			C			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	24.3		12.2	7.1	24.0		18.7				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.6	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+I+3), s	14.3	10.8		4.4	4.4	9.2		11.1				
Green Ext Time (p_c), s	0.1	5.9		0.4	0.1	4.7		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			20.1									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh 14.7

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	143	265	0	8	35	260	0	6	8	175	17	36
Future Vol, veh/h	143	265	0	8	35	260	0	6	8	175	17	36
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	10	5	5	142	71	71	0	0	0
Mvmt Flow	164	305	0	9	40	299	0	7	9	201	20	41
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	14.8	13.4	11.2	16.6
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	77%
Vol Thru, %	43%	38%	100%	0%	100%	4%	7%
Vol Right, %	57%	0%	0%	0%	0%	96%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	231	177	8	23	272	228
LT Vol	0	143	0	8	0	0	175
Through Vol	6	88	177	0	23	12	17
RT Vol	8	0	0	0	0	260	36
Lane Flow Rate	16	266	203	9	27	312	262
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.036	0.5	0.364	0.018	0.047	0.491	0.504
Departure Headway (Hd)	8.125	6.774	6.459	6.939	6.343	5.661	6.926
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	438	529	554	514	562	634	519
Service Time	5.921	4.54	4.225	4.703	4.107	3.424	4.687
HCM Lane V/C Ratio	0.037	0.503	0.366	0.018	0.048	0.492	0.505
HCM Control Delay	11.2	16.2	12.9	9.8	9.4	13.8	16.6
HCM Lane LOS	B	C	B	A	A	B	C
HCM 95th-tile Q	0.1	2.8	1.7	0.1	0.1	2.7	2.8

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↰↰↰	↰	↰	↰↰	↰			
Traffic Volume (veh/h)	511	1123	0	0	1578	625	77	186	525	0	0	0
Future Volume (veh/h)	511	1123	0	0	1578	625	77	186	525	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	527	1158	0	0	1627	0	79	192	0			
Adj No. of Lanes	2	2	0	0	3	1	1	2	1			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	567	3007	0	0	3338	1039	173	348	156			
Arrive On Green	0.16	0.84	0.00	0.00	1.00	0.00	0.10	0.10	0.00			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	3574	1599			
Grp Volume(v), veh/h	527	1158	0	0	1627	0	79	192	0			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1787	1599			
Q Serve(g_s), s	22.7	11.4	0.0	0.0	0.0	0.0	6.3	7.7	0.0			
Cycle Q Clear(g_c), s	22.7	11.4	0.0	0.0	0.0	0.0	6.3	7.7	0.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	567	3007	0	0	3338	1039	173	348	156			
V/C Ratio(X)	0.93	0.39	0.00	0.00	0.49	0.00	0.46	0.55	0.00			
Avail Cap(c_a), veh/h	574	3007	0	0	3338	1039	412	829	371			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.58	0.00	1.00	1.00	0.00			
Uniform Delay (d), s/veh	61.8	2.8	0.0	0.0	0.0	0.0	64.0	64.6	0.0			
Incr Delay (d2), s/veh	21.3	0.4	0.0	0.0	0.3	0.0	0.7	0.5	0.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.4	5.6	0.0	0.0	0.1	0.0	3.1	3.8	0.0			
LnGrp Delay(d),s/veh	83.1	3.2	0.0	0.0	0.3	0.0	64.7	65.1	0.0			
LnGrp LOS	F	A			A		E	E				
Approach Vol, veh/h	1685				1627			271				
Approach Delay, s/veh	28.2				0.3			65.0				
Approach LOS	C				A			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		131.2			28.7	102.5		18.8				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		106.0			25.0	77.0		34.8				
Max Q Clear Time (g_c+I1), s		13.4			24.7	2.0		9.7				
Green Ext Time (p_c), s		37.3			0.1	52.3		0.8				
Intersection Summary												
HCM 2010 Ctrl Delay			18.3									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Existing Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	   		 	  		 	 		 	 	
Traffic Volume (veh/h)	137	1356	155	136	1389	69	323	437	270	176	224	493
Future Volume (veh/h)	137	1356	155	136	1389	69	323	437	270	176	224	493
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.89	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	140	1384	147	139	1417	0	330	446	71	180	229	0
Adj No. of Lanes	2	4	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	184	2748	291	187	2370	609	373	899	357	189	893	400
Arrive On Green	0.11	0.92	0.92	0.05	0.46	0.00	0.11	0.25	0.25	0.11	0.25	0.00
Sat Flow, veh/h	3442	5965	632	3442	5136	1319	3442	3574	1420	1774	3574	1599
Grp Volume(v), veh/h	140	1125	406	139	1417	0	330	446	71	180	229	0
Grp Sat Flow(s),veh/h/ln	1721	1618	1744	1721	1712	1319	1721	1787	1420	1774	1787	1599
Q Serve(g_s), s	5.9	5.1	5.1	6.0	30.8	0.0	14.2	16.0	5.9	15.1	7.7	0.0
Cycle Q Clear(g_c), s	5.9	5.1	5.1	6.0	30.8	0.0	14.2	16.0	5.9	15.1	7.7	0.0
Prop In Lane	1.00		0.36	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	2236	803	187	2370	609	373	899	357	189	893	400
V/C Ratio(X)	0.76	0.50	0.50	0.74	0.60	0.00	0.89	0.50	0.20	0.95	0.26	0.00
Avail Cap(c_a), veh/h	252	2236	803	597	2370	609	390	929	369	189	905	405
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	0.71	0.71	0.00	1.00	1.00	1.00	0.89	0.89	0.00
Uniform Delay (d), s/veh	66.1	3.4	3.4	69.9	30.0	0.0	66.0	48.0	44.2	66.6	45.1	0.0
Incr Delay (d2), s/veh	5.9	0.5	1.5	1.6	0.8	0.0	19.4	0.2	0.1	47.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	2.2	2.6	2.9	14.7	0.0	7.7	7.9	2.3	9.9	3.8	0.0
LnGrp Delay(d),s/veh	72.0	3.9	4.9	71.5	30.8	0.0	85.3	48.1	44.3	114.1	45.1	0.0
LnGrp LOS	E	A	A	E	C		F	D	D	F	D	
Approach Vol, veh/h	1671				1556		847				409	
Approach Delay, s/veh	9.9				34.5		62.3				75.5	
Approach LOS	A				C		E				E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.1	75.1	20.3	42.5	12.0	75.2	20.0	42.7				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.6	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+I), s	19.0	7.1	16.2	9.7	7.9	32.8	17.1	18.0				
Green Ext Time (p_c), s	0.2	31.8	0.1	1.0	0.1	24.5	0.0	2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			34.3									
HCM 2010 LOS			C									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Existing Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  			  						 	
Traffic Volume (veh/h)	77	1655	58	128	1412	314	101	36	450	362	40	91
Future Volume (veh/h)	77	1655	58	128	1412	314	101	36	450	362	40	91
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.95	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1866	1881
Adj Flow Rate, veh/h	81	1742	0	135	1486	0	106	38	273	411	0	40
Adj No. of Lanes	2	4	0	1	3	1	1	1	0	2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	133	2367	0	157	2134	664	397	42	305	670	0	280
Arrive On Green	0.01	0.12	0.00	0.09	0.42	0.00	0.22	0.22	0.22	0.19	0.00	0.19
Sat Flow, veh/h	3442	6735	0	1774	5136	1599	1774	190	1364	3548	0	1484
Grp Volume(v), veh/h	81	1742	0	135	1486	0	106	0	311	411	0	40
Grp Sat Flow(s),veh/h/ln	1721	1618	0	1774	1712	1599	1774	0	1554	1774	0	1484
Q Serve(g_s), s	3.5	39.0	0.0	11.3	35.7	0.0	7.4	0.0	29.1	15.9	0.0	3.4
Cycle Q Clear(g_c), s	3.5	39.0	0.0	11.3	35.7	0.0	7.4	0.0	29.1	15.9	0.0	3.4
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.88	1.00		1.00
Lane Grp Cap(c), veh/h	133	2367	0	157	2134	664	397	0	348	670	0	280
V/C Ratio(X)	0.61	0.74	0.00	0.86	0.70	0.00	0.27	0.00	0.89	0.61	0.00	0.14
Avail Cap(c_a), veh/h	184	2367	0	248	2134	664	414	0	363	852	0	356
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.00	0.86	0.86	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	72.9	59.0	0.0	67.5	36.1	0.0	48.1	0.0	56.5	55.8	0.0	50.7
Incr Delay (d2), s/veh	1.3	1.7	0.0	8.6	1.6	0.0	0.1	0.0	22.1	0.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.8	17.8	0.0	5.9	17.2	0.0	3.6	0.0	14.7	7.9	0.0	1.4
LnGrp Delay(d),s/veh	74.2	60.6	0.0	76.1	37.7	0.0	48.2	0.0	78.6	56.2	0.0	50.8
LnGrp LOS	E	E		E	D		D		E	E		D
Approach Vol, veh/h	1823				1621		417				451	
Approach Delay, s/veh	61.2				40.9		70.9				55.7	
Approach LOS	E				D		E				E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	60.9		33.3	9.8	68.3		38.6				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	21.0	38.0		36.0	8.0	51.0		35.0				
Max Q Clear Time (g_c+11.3), s	11.3	41.0		17.9	5.5	37.7		31.1				
Green Ext Time (p_c), s	0.0	0.0		0.9	0.0	11.7		0.6				
Intersection Summary												
HCM 2010 Ctrl Delay	53.9											
HCM 2010 LOS	D											
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Existing Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  							
Traffic Volume (veh/h)	86	2406	57	68	1567	38	178	51	367	41	17	33
Future Volume (veh/h)	86	2406	57	68	1567	38	178	51	367	41	17	33
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	90	2506	43	71	1632	39	185	53	320	43	18	7
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	0	0	0	0	0	0
Cap, veh/h	82	3170	951	82	3182	76	39	0	396	38	10	353
Arrive On Green	0.05	0.62	0.62	0.05	0.62	0.62	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1540	1774	5155	123	0	0	1605	0	40	1429
Grp Volume(v), veh/h	90	2506	43	71	1084	587	238	0	320	61	0	7
Grp Sat Flow(s),veh/h/ln	1774	1712	1540	1774	1712	1854	0	0	1605	40	0	1429
Q Serve(g_s), s	7.5	59.1	1.8	6.4	28.7	28.7	0.0	0.0	30.4	0.0	0.0	0.6
Cycle Q Clear(g_c), s	7.5	59.1	1.8	6.4	28.7	28.7	40.0	0.0	30.4	40.0	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.07	0.78		1.00	0.70		1.00
Lane Grp Cap(c), veh/h	82	3170	951	82	2113	1145	39	0	396	48	0	353
V/C Ratio(X)	1.10	0.79	0.05	0.86	0.51	0.51	6.03	0.00	0.81	1.28	0.00	0.02
Avail Cap(c_a), veh/h	82	3170	951	82	2113	1145	39	0	396	48	0	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.55	0.55	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	77.3	23.2	12.2	76.7	17.4	17.4	81.0	0.0	57.4	72.9	0.0	46.2
Incr Delay (d2), s/veh	101.9	1.2	0.0	55.1	0.9	1.6	2315.1	0.0	10.9	222.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	28.2	0.8	4.4	13.8	15.2	27.2	0.0	14.7	5.1	0.0	0.2
LnGrp Delay(d),s/veh	179.5	24.3	12.3	131.9	18.3	19.0	2396.1	0.0	68.3	295.7	0.0	46.2
LnGrp LOS	F	C	B	F	B	B	F		E	F		D
Approach Vol, veh/h	2639			1742			558			68		
Approach Delay, s/veh	29.4			23.1			1061.1			270.0		
Approach LOS	C			C			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	105.0		45.0	12.0	105.0		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	5	100.0		40.0	7.5	88.0		40.0				
Max Q Clear Time (g_c+1/4), s	13.4	61.1		42.0	9.5	30.7		42.0				
Green Ext Time (p_c), s	0.0	38.0		0.0	0.0	43.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	145.5											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Approved Projects AM

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (veh/h)	140	20	40	40	30	30	210	220	20	60	1130	310				
Future Volume (veh/h)	140	20	40	40	30	30	210	220	20	60	1130	310				
Number	7	4	14	3	8	18	5	2	12	1	6	16				
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0				
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.95	1.00		0.98				
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Adj Sat Flow, veh/h/ln	1827	1849	1900	1900	1848	1900	1827	1863	1900	1827	1863	1900				
Adj Flow Rate, veh/h	104	97	28	45	34	24	236	247	20	67	1270	336				
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0				
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89				
Percent Heavy Veh, %	4	2	2	2	2	2	4	2	2	4	2	2				
Cap, veh/h	182	144	42	57	43	30	266	2090	168	86	1466	379				
Arrive On Green	0.10	0.10	0.10	0.07	0.07	0.07	0.15	0.63	0.62	0.05	0.53	0.52				
Sat Flow, veh/h	1740	1373	396	760	574	405	1740	3303	265	1740	2768	717				
Grp Volume(v), veh/h	104	0	125	103	0	0	236	131	136	67	802	804				
Grp Sat Flow(s),veh/h/ln	1740	0	1769	1739	0	0	1740	1770	1799	1740	1770	1715				
Q Serve(g_s), s	6.6	0.0	7.9	6.8	0.0	0.0	15.4	3.4	3.5	4.4	45.2	48.3				
Cycle Q Clear(g_c), s	6.6	0.0	7.9	6.8	0.0	0.0	15.4	3.4	3.5	4.4	45.2	48.3				
Prop In Lane	1.00		0.22	0.44		0.23	1.00		0.15	1.00		0.42				
Lane Grp Cap(c), veh/h	182	0	186	130	0	0	266	1120	1138	86	937	908				
V/C Ratio(X)	0.57	0.00	0.67	0.79	0.00	0.00	0.89	0.12	0.12	0.78	0.86	0.89				
Avail Cap(c_a), veh/h	480	0	488	330	0	0	480	1120	1138	480	969	939				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00				
Uniform Delay (d), s/veh	49.4	0.0	50.0	52.7	0.0	0.0	48.1	8.4	8.5	54.5	23.5	24.5				
Incr Delay (d2), s/veh	1.0	0.0	1.6	4.0	0.0	0.0	4.0	0.1	0.1	5.6	7.7	10.2				
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				
%ile BackOfQ(50%),veh/ln	3.2	0.0	3.9	3.4	0.0	0.0	7.7	1.7	1.8	2.3	24.1	25.4				
LnGrp Delay(d),s/veh	50.4	0.0	51.6	56.8	0.0	0.0	52.2	8.5	8.6	60.0	31.2	34.7				
LnGrp LOS	D		D	E			D	A	A	E	C	C				
Approach Vol, veh/h	229			103			503			1673						
Approach Delay, s/veh	51.1			56.8			29.0			34.0						
Approach LOS	D			E			C			C						
Timer	1	2	3	4	5	6	7	8								
Assigned Phs	1	2			4	5	6	8								
Phs Duration (G+Y+Rc), s	9.7	77.4			16.2	21.7	65.4	12.7								
Change Period (Y+Rc), s	4.0	5.5			4.0	4.0	5.5	4.0								
Max Green Setting (Gmax), s	32.0	62.0			32.0	32.0	62.0	22.0								
Max Q Clear Time (g_c+I1), s	6.4	5.5			9.9	17.4	50.3	8.8								
Green Ext Time (p_c), s	0.1	2.5			0.6	0.3	9.6	0.3								
Intersection Summary																
HCM 2010 Ctrl Delay				35.5												
HCM 2010 LOS				D												
Notes																

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Existing Plus Approved Projects AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↰↱↲		↰	↰↱	
Traffic Volume (veh/h)	10	0	10	180	30	170	30	290	40	120	1010	100
Future Volume (veh/h)	10	0	10	180	30	170	30	290	40	120	1010	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.96	1.00		0.95	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1832	1863	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	11	0	6	198	33	76	33	319	33	132	1110	106
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	0	244	204	0	245	179	38	2293	231	172	1850	176
Arrive On Green	0.00	0.00	0.13	0.00	0.13	0.13	0.02	0.49	0.47	0.10	0.57	0.55
Sat Flow, veh/h	0	1827	1530	0	1832	1341	1740	4670	471	1740	3256	311
Grp Volume(v), veh/h	0	0	6	0	33	76	33	229	123	132	603	613
Grp Sat Flow(s),veh/h/ln	0	1827	1530	0	1832	1341	1740	1695	1751	1740	1770	1797
Q Serve(g_s), s	0.0	0.0	0.1	0.0	0.7	2.3	0.8	1.6	1.7	3.2	9.7	9.8
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.0	0.7	2.3	0.8	1.6	1.7	3.2	9.7	9.8
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.27	1.00		0.17
Lane Grp Cap(c), veh/h	0	244	204	0	245	179	38	1665	860	172	1006	1021
V/C Ratio(X)	0.00	0.00	0.03	0.00	0.13	0.42	0.88	0.14	0.14	0.77	0.60	0.60
Avail Cap(c_a), veh/h	0	1347	1128	0	1773	1298	1283	2578	1331	1283	1346	1366
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	16.4	0.0	16.6	17.3	21.2	6.0	6.1	19.1	6.1	6.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.1	0.6	20.5	0.1	0.1	2.7	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.0	0.4	0.9	0.6	0.7	0.8	1.7	4.7	5.0
LnGrp Delay(d),s/veh	0.0	0.0	16.4	0.0	16.7	17.9	41.6	6.1	6.2	21.8	7.0	7.0
LnGrp LOS			B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		6			109			385			1348	
Approach Delay, s/veh		16.4			17.5			9.2			8.4	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	25.3	0.0	9.8	4.9	28.7	0.0	9.8				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	15.2	3.7	0.0	2.1	2.8	11.8	0.0	4.3				
Green Ext Time (p_c), s	0.2	3.2	0.0	0.0	0.0	11.8	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			9.2									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Existing Plus Approved Projects AM

Intersection

Intersection Delay, s/veh39.8

Intersection LOS E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	60	40	120	230	40	120	90	60	80	270	60
Future Vol, veh/h	20	60	40	120	230	40	120	90	60	80	270	60
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	23	68	45	136	261	45	136	102	68	91	307	68
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	14	48.4	23.5	50
HCM LOS	B	E	C	E

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	44%	100%	0%	31%	20%
Vol Thru, %	33%	0%	60%	59%	66%
Vol Right, %	22%	0%	40%	10%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	270	20	100	390	410
LT Vol	120	20	0	120	80
Through Vol	90	0	60	230	270
RT Vol	60	0	40	40	60
Lane Flow Rate	307	23	114	443	466
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.645	0.059	0.267	0.907	0.922
Departure Headway (Hd)	7.573	9.326	8.463	7.366	7.124
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	476	382	423	492	508
Service Time	5.657	7.124	6.26	5.435	5.195
HCM Lane V/C Ratio	0.645	0.06	0.27	0.9	0.917
HCM Control Delay	23.5	12.7	14.3	48.4	50
HCM Lane LOS	C	B	B	E	E
HCM 95th-tile Q	4.5	0.2	1.1	10.3	10.9

Intersection

Intersection Delay, s/veh 10.3

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔			↔	
Traffic Vol, veh/h	150	20	20	0	30	10	20	10	10	10	10	340
Future Vol, veh/h	150	20	20	0	30	10	20	10	10	10	10	340
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	1	1	2	1	1	2	1	1	2	1	1
Mvmt Flow	165	22	22	0	33	11	22	11	11	11	11	374
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.2	8.4	8.6	10.8
HCM LOS	B	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	79%	0%	3%
Vol Thru, %	0%	50%	11%	75%	3%
Vol Right, %	0%	50%	11%	25%	94%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	20	190	40	360
LT Vol	20	0	150	0	10
Through Vol	0	10	20	30	10
RT Vol	0	10	20	10	340
Lane Flow Rate	22	22	209	44	396
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.037	0.031	0.292	0.061	0.46
Departure Headway (Hd)	6.033	5.157	5.037	5.015	4.185
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	591	691	710	708	858
Service Time	3.792	2.915	3.097	3.087	2.22
HCM Lane V/C Ratio	0.037	0.032	0.294	0.062	0.462
HCM Control Delay	9	8.1	10.2	8.4	10.8
HCM Lane LOS	A	A	B	A	B
HCM 95th-tile Q	0.1	0.1	1.2	0.2	2.5

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Existing Plus Approved Projects AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	50	40	90	50	50	80	240	50	130	850	220
Future Volume (veh/h)	70	50	40	90	50	50	80	240	50	130	850	220
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		0.94	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1900	1863	1881	1881	1863	1881	1900
Adj Flow Rate, veh/h	76	54	7	98	54	24	87	261	19	141	924	224
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	280	499	63	290	196	87	113	1311	552	179	1144	277
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.06	0.37	0.37	0.10	0.40	0.39
Sat Flow, veh/h	1774	3163	398	1774	1200	534	1774	3574	1506	1774	2835	686
Grp Volume(v), veh/h	76	30	31	98	0	78	87	261	19	141	582	566
Grp Sat Flow(s),veh/h/ln	1774	1787	1774	1774	0	1734	1774	1787	1506	1774	1787	1733
Q Serve(g_s), s	2.9	1.1	1.1	3.7	0.0	3.0	3.7	3.8	0.6	5.9	21.8	21.9
Cycle Q Clear(g_c), s	2.9	1.1	1.1	3.7	0.0	3.0	3.7	3.8	0.6	5.9	21.8	21.9
Prop In Lane	1.00		0.22	1.00		0.31	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	280	282	280	290	0	283	113	1311	552	179	721	700
V/C Ratio(X)	0.27	0.11	0.11	0.34	0.00	0.28	0.77	0.20	0.03	0.79	0.81	0.81
Avail Cap(c_a), veh/h	610	615	610	610	0	596	516	1560	657	516	780	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	27.3	27.3	28.0	0.0	27.7	34.9	16.4	15.4	33.2	19.9	20.1
Incr Delay (d2), s/veh	0.2	0.1	0.1	0.3	0.0	0.2	4.1	0.1	0.0	2.9	6.3	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4	0.5	0.6	1.8	0.0	1.4	1.9	1.9	0.3	3.0	11.9	11.7
LnGrp Delay(d),s/veh	28.2	27.3	27.4	28.3	0.0	27.9	39.0	16.5	15.4	36.2	26.2	26.7
LnGrp LOS	C	C	C	C		C	D	B	B	D	C	C
Approach Vol, veh/h		137			176			367			1289	
Approach Delay, s/veh		27.8			28.1			21.7			27.5	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	31.7		15.9	8.8	34.5		16.4				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+I1), s	5.8			4.9	5.7	23.9		5.7				
Green Ext Time (p_c), s	0.2	2.5		0.3	0.1	5.6		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			26.5									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh24.7

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	40	50	10	10	160	180	0	10	10	310	10	150
Future Vol, veh/h	40	50	10	10	160	180	0	10	10	310	10	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	43	54	11	11	174	196	0	11	11	337	11	163
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	11.5	12.4	9.6	37.3
HCM LOS	B	B	A	E

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	66%
Vol Thru, %	50%	38%	71%	0%	100%	23%	2%
Vol Right, %	50%	0%	29%	0%	0%	77%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	65	35	10	107	233	470
LT Vol	0	40	0	10	0	0	310
Through Vol	10	25	25	0	107	53	10
RT Vol	10	0	10	0	0	180	150
Lane Flow Rate	22	71	38	11	116	254	511
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.039	0.153	0.076	0.021	0.211	0.422	0.873
Departure Headway (Hd)	6.53	7.798	7.221	7.106	6.544	5.992	6.151
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	545	458	493	502	546	599	588
Service Time	4.311	5.582	5.005	4.871	4.308	3.757	3.892
HCM Lane V/C Ratio	0.04	0.155	0.077	0.022	0.212	0.424	0.869
HCM Control Delay	9.6	12	10.6	10	11.1	13.1	37.3
HCM Lane LOS	A	B	B	A	B	B	E
HCM 95th-tile Q	0.1	0.5	0.2	0.1	0.8	2.1	9.9

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Approved Projects AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	390	990	0	0	1670	600	170	580	1060	0	0	0
Future Volume (veh/h)	390	990	0	0	1670	600	170	580	1060	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	406	1031	0	0	1740	0	177	604	981			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	382	1938	0	0	1985	618	631	669	1135			
Arrive On Green	0.11	0.54	0.00	0.00	0.39	0.00	0.36	0.36	0.36			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3190			
Grp Volume(v), veh/h	406	1031	0	0	1740	0	177	604	981			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1595			
Q Serve(g_s), s	10.0	16.7	0.0	0.0	28.3	0.0	6.4	27.4	25.8			
Cycle Q Clear(g_c), s	10.0	16.7	0.0	0.0	28.3	0.0	6.4	27.4	25.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	382	1938	0	0	1985	618	631	669	1135			
V/C Ratio(X)	1.06	0.53	0.00	0.00	0.88	0.00	0.28	0.90	0.86			
Avail Cap(c_a), veh/h	382	1938	0	0	1985	618	670	711	1205			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.55	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	40.0	13.3	0.0	0.0	25.6	0.0	20.8	27.5	27.0			
Incr Delay (d2), s/veh	63.3	1.1	0.0	0.0	3.4	0.0	0.1	13.8	6.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.1	8.4	0.0	0.0	14.0	0.0	3.2	16.6	12.3			
LnGrp Delay(d),s/veh	103.3	14.3	0.0	0.0	29.0	0.0	20.8	41.3	33.0			
LnGrp LOS	F	B			C		C	D	C			
Approach Vol, veh/h		1437			1740			1762				
Approach Delay, s/veh		39.5			29.0			34.6				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		53.8			14.0	39.8		36.2				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		46.8			10.0	32.8		34.0				
Max Q Clear Time (g_c+I1), s		18.7			12.0	30.3		29.4				
Green Ext Time (p_c), s		17.4			0.0	2.4		2.5				
Intersection Summary												
HCM 2010 Ctrl Delay				34.0								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Existing Plus Approved Projects AM

	            											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 			 	
Traffic Volume (veh/h)	220	1530	310	410	1800	140	240	230	50	100	590	240
Future Volume (veh/h)	220	1530	310	410	1800	140	240	230	50	100	590	240
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.84	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	227	1577	297	423	1856	0	247	237	14	103	608	139
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	252	1732	324	473	2384	612	294	950	359	124	895	389
Arrive On Green	0.07	0.40	0.40	0.14	0.46	0.00	0.09	0.27	0.27	0.07	0.25	0.25
Sat Flow, veh/h	3442	4329	811	3442	5136	1319	3442	3574	1351	1774	3574	1555
Grp Volume(v), veh/h	227	1245	629	423	1856	0	247	237	14	103	608	139
Grp Sat Flow(s),veh/h/ln	1721	1712	1716	1721	1712	1319	1721	1787	1351	1774	1787	1555
Q Serve(g_s), s	9.8	51.4	52.0	18.1	45.5	0.0	10.6	7.8	1.2	8.6	23.0	11.0
Cycle Q Clear(g_c), s	9.8	51.4	52.0	18.1	45.5	0.0	10.6	7.8	1.2	8.6	23.0	11.0
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	252	1370	687	473	2384	612	294	950	359	124	895	389
V/C Ratio(X)	0.90	0.91	0.92	0.89	0.78	0.00	0.84	0.25	0.04	0.83	0.68	0.36
Avail Cap(c_a), veh/h	252	1370	687	597	2384	612	390	950	359	189	905	394
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	1.00	0.00	1.00	1.00	1.00	0.44	0.44	0.44
Uniform Delay (d), s/veh	69.0	42.4	42.6	63.6	33.7	0.0	67.6	43.3	40.9	68.9	50.8	46.3
Incr Delay (d2), s/veh	23.5	7.4	13.9	12.0	2.6	0.0	9.3	0.1	0.0	4.7	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	25.6	27.3	9.4	22.1	0.0	5.4	3.9	0.4	4.4	11.5	4.7
LnGrp Delay(d),s/veh	92.5	49.8	56.4	75.6	36.3	0.0	76.9	43.4	40.9	73.6	51.5	46.4
LnGrp LOS	F	D	E	E	D		E	D	D	E	D	D
Approach Vol, veh/h	2101			2279			498			850		
Approach Delay, s/veh	56.4			43.6			59.9			53.3		
Approach LOS	E			D			E			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.6	66.0	16.8	42.6	15.0	75.6	14.5	44.9				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.6	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+20), s	20.1	54.0	12.6	25.0	11.8	47.5	10.6	9.8				
Green Ext Time (p_c), s	0.5	0.0	0.2	2.6	0.0	16.4	0.0	1.0				
Intersection Summary												
HCM 2010 Ctrl Delay	51.2											
HCM 2010 LOS	D											

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Existing Plus Approved Projects AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	1440	160	240	2150	420	40	30	160	260	70	80
Future Volume (veh/h)	70	1440	160	240	2150	420	40	30	160	260	70	80
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		0.93	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1870	1881
Adj Flow Rate, veh/h	73	1500	156	250	2240	0	42	31	32	172	212	35
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	131	1832	190	248	2523	786	244	113	116	354	373	291
Arrive On Green	0.03	0.26	0.26	0.14	0.49	0.00	0.14	0.14	0.14	0.20	0.20	0.20
Sat Flow, veh/h	3442	4704	489	1774	5136	1599	1774	817	843	1774	1870	1460
Grp Volume(v), veh/h	73	1091	565	250	2240	0	42	0	63	172	212	35
Grp Sat Flow(s),veh/h/ln	1721	1712	1769	1774	1712	1599	1774	0	1660	1774	1870	1460
Q Serve(g_s), s	3.1	44.9	45.0	21.0	59.0	0.0	3.1	0.0	5.1	12.9	15.3	2.9
Cycle Q Clear(g_c), s	3.1	44.9	45.0	21.0	59.0	0.0	3.1	0.0	5.1	12.9	15.3	2.9
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	131	1333	689	248	2523	786	244	0	229	354	373	291
V/C Ratio(X)	0.56	0.82	0.82	1.01	0.89	0.00	0.17	0.00	0.28	0.49	0.57	0.12
Avail Cap(c_a), veh/h	184	1333	689	248	2523	786	414	0	387	426	449	351
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.47	0.47	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.8	50.4	50.5	64.5	34.4	0.0	57.1	0.0	58.0	53.2	54.2	49.2
Incr Delay (d2), s/veh	1.4	5.7	10.5	40.7	2.5	0.0	0.1	0.0	0.2	0.4	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	22.4	24.1	13.1	28.4	0.0	1.5	0.0	2.4	6.3	8.0	1.2
LnGrp Delay(d),s/veh	73.2	56.1	61.0	105.2	36.9	0.0	57.2	0.0	58.2	53.6	54.7	49.3
LnGrp LOS	E	E	E	F	D		E		E	D	D	D
Approach Vol, veh/h	1729				2490		105				419	
Approach Delay, s/veh	58.4				43.8		57.8				53.8	
Approach LOS	E				D		E				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	64.4		34.9	9.7	79.7		25.7				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	21.0	38.0		36.0	8.0	51.0		35.0				
Max Q Clear Time (g_c+23.0), s	23.0	47.0		17.3	5.1	61.0		7.1				
Green Ext Time (p_c), s	0.0	0.0		1.1	0.0	0.0		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			50.3									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Existing Plus Approved Projects AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑	↱		↰	↱		↰	↱
Traffic Volume (veh/h)	40	1640	120	90	2730	40	70	40	60	70	170	70
Future Volume (veh/h)	40	1640	120	90	2730	40	70	40	60	70	170	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.95	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1869	1881	1900	1876	1881
Adj Flow Rate, veh/h	42	1726	84	95	2874	41	74	42	11	74	179	39
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	54	3170	957	82	3301	47	36	13	390	29	34	347
Arrive On Green	0.03	0.62	0.62	0.05	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1550	1774	5214	74	0	53	1578	0	138	1404
Grp Volume(v), veh/h	42	1726	84	95	1881	1034	116	0	11	253	0	39
Grp Sat Flow(s), veh/h/ln	1774	1712	1550	1774	1712	1864	53	0	1578	138	0	1404
Q Serve(g_s), s	3.8	31.4	3.6	7.5	72.5	74.0	0.0	0.0	0.9	0.0	0.0	3.5
Cycle Q Clear(g_c), s	3.8	31.4	3.6	7.5	72.5	74.0	40.0	0.0	0.9	40.0	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.04	0.64		1.00	0.29		1.00
Lane Grp Cap(c), veh/h	54	3170	957	82	2168	1180	49	0	390	63	0	347
V/C Ratio(X)	0.78	0.54	0.09	1.16	0.87	0.88	2.34	0.00	0.03	4.02	0.00	0.11
Avail Cap(c_a), veh/h	82	3170	957	82	2168	1180	49	0	390	63	0	347
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.16	0.16	0.16	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.0	17.9	12.5	77.3	24.2	24.5	70.6	0.0	46.3	60.1	0.0	47.3
Incr Delay (d2), s/veh	1.8	0.1	0.0	147.7	5.0	9.2	662.5	0.0	0.0	1397.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	14.7	1.5	7.0	35.5	40.9	11.3	0.0	0.4	27.2	0.0	1.4
LnGrp Delay(d),s/veh	79.8	18.0	12.6	225.0	29.2	33.7	733.1	0.0	46.3	1457.9	0.0	47.3
LnGrp LOS	E	B	B	F	C	C	F		D	F		D
Approach Vol, veh/h	1852			3010			127			292		
Approach Delay, s/veh	19.1			36.9			673.6			1269.5		
Approach LOS	B			D			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	105.0		45.0	9.4	107.6		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	5	100.0		40.0	7.5	88.0		40.0				
Max Q Clear Time (g_c+19), s	5	33.4		42.0	5.8	76.0		42.0				
Green Ext Time (p_c), s	0.0	52.5		0.0	0.0	12.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	114.2											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Approved Projects PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	50	20	20	40	20	420	610	50	60	310	290
Future Volume (veh/h)	280	50	20	20	40	20	420	610	50	60	310	290
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1841	1900	1900	1900	1900	1863	1881	1900	1827	1863	1900
Adj Flow Rate, veh/h	197	226	20	23	45	16	477	693	54	68	352	210
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	4	2	2	0	0	0	2	1	1	4	2	2
Cap, veh/h	310	297	26	31	60	21	516	1738	135	88	589	343
Arrive On Green	0.18	0.18	0.18	0.06	0.06	0.06	0.29	0.52	0.50	0.05	0.28	0.26
Sat Flow, veh/h	1740	1666	147	493	965	343	1774	3346	261	1740	2113	1232
Grp Volume(v), veh/h	197	0	246	84	0	0	477	370	377	68	293	269
Grp Sat Flow(s),veh/h/ln	1740	0	1813	1801	0	0	1774	1787	1820	1740	1770	1576
Q Serve(g_s), s	8.8	0.0	10.9	3.9	0.0	0.0	22.0	10.6	10.6	3.3	12.1	12.6
Cycle Q Clear(g_c), s	8.8	0.0	10.9	3.9	0.0	0.0	22.0	10.6	10.6	3.3	12.1	12.6
Prop In Lane	1.00		0.08	0.27		0.19	1.00		0.14	1.00		0.78
Lane Grp Cap(c), veh/h	310	0	323	112	0	0	516	928	945	88	493	439
V/C Ratio(X)	0.63	0.00	0.76	0.75	0.00	0.00	0.92	0.40	0.40	0.78	0.59	0.61
Avail Cap(c_a), veh/h	661	0	688	470	0	0	674	1347	1371	661	1333	1187
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	0.0	32.9	38.9	0.0	0.0	29.0	12.3	12.4	39.5	26.3	27.0
Incr Delay (d2), s/veh	0.8	0.0	1.4	3.8	0.0	0.0	13.9	0.4	0.4	5.4	1.6	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	5.6	2.0	0.0	0.0	12.7	5.2	5.4	1.7	6.1	5.7
LnGrp Delay(d),s/veh	32.9	0.0	34.3	42.7	0.0	0.0	42.9	12.7	12.7	45.0	27.9	28.9
LnGrp LOS	C		C	D			D	B	B	D	C	C
Approach Vol, veh/h		443			84			1224			630	
Approach Delay, s/veh		33.7			42.7			24.5			30.2	
Approach LOS		C			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	47.8		19.0	28.5	27.5		9.2				
Change Period (Y+Rc), s	4.0	5.5		4.0	4.0	5.5		4.0				
Max Green Setting (Gmax), s	32.0	62.0		32.0	32.0	62.0		22.0				
Max Q Clear Time (g_c+I1), s	5.3	12.6		12.9	24.0	14.6		5.9				
Green Ext Time (p_c), s	0.1	8.4		1.2	0.6	6.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			28.3									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Existing Plus Approved Projects PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↰↱↲		↰	↰↱	
Traffic Volume (veh/h)	60	30	130	90	10	250	20	770	60	50	300	10
Future Volume (veh/h)	60	30	130	90	10	250	20	770	60	50	300	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1797	1845	1863	1881	1900	1792	1845	1900
Adj Flow Rate, veh/h	69	34	79	103	11	120	23	885	64	57	345	10
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	3	3	3	2	1	1	6	3	3
Cap, veh/h	0	283	234	0	267	201	25	2357	170	67	1769	51
Arrive On Green	0.00	0.15	0.15	0.00	0.15	0.15	0.01	0.48	0.46	0.04	0.51	0.48
Sat Flow, veh/h	0	1900	1569	0	1797	1348	1774	4875	351	1707	3477	101
Grp Volume(v), veh/h	0	34	79	0	11	120	23	621	328	57	174	181
Grp Sat Flow(s),veh/h/ln	0	1900	1569	0	1797	1348	1774	1712	1803	1707	1752	1825
Q Serve(g_s), s	0.0	0.6	1.6	0.0	0.2	3.0	0.5	4.2	4.2	1.2	2.0	2.0
Cycle Q Clear(g_c), s	0.0	0.6	1.6	0.0	0.2	3.0	0.5	4.2	4.2	1.2	2.0	2.0
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.19	1.00		0.06
Lane Grp Cap(c), veh/h	0	283	234	0	267	201	25	1655	872	67	891	928
V/C Ratio(X)	0.00	0.12	0.34	0.00	0.04	0.60	0.91	0.37	0.38	0.85	0.19	0.20
Avail Cap(c_a), veh/h	0	1664	1374	0	2065	1550	1553	3091	1628	1495	1582	1648
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.5	13.9	0.0	13.3	14.5	18.0	6.0	6.0	17.4	4.9	4.9
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.0	0.0	1.1	32.9	0.2	0.4	10.4	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.7	0.0	0.1	1.2	0.5	1.9	2.1	0.7	1.0	1.0
LnGrp Delay(d),s/veh	0.0	13.6	14.3	0.0	13.3	15.6	50.9	6.2	6.4	27.8	5.0	5.1
LnGrp LOS		B	B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		113			131			972			412	
Approach Delay, s/veh		14.0			15.4			7.3			8.2	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	21.7	0.0	9.4	4.5	22.6	0.0	9.4				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	13.2	6.2	0.0	3.6	2.5	4.0	0.0	5.0				
Green Ext Time (p_c), s	0.1	9.7	0.0	0.2	0.0	3.2	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			8.7									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Existing Plus Approved Projects PM

Intersection

Intersection Delay, s/veh 22.3

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	140	40	50	80	50	150	190	80	80	170	40
Future Vol, veh/h	30	140	40	50	80	50	150	190	80	80	170	40
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	0	0	0	6	3	3	0	0	0
Mvmt Flow	34	157	45	56	90	56	169	213	90	90	191	45
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	14.8	14.9	31.9	18.4
HCM LOS	B	B	D	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	36%	100%	0%	28%	28%
Vol Thru, %	45%	0%	78%	44%	59%
Vol Right, %	19%	0%	22%	28%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	420	30	180	180	290
LT Vol	150	30	0	50	80
Through Vol	190	0	140	80	170
RT Vol	80	0	40	50	40
Lane Flow Rate	472	34	202	202	326
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.82	0.075	0.414	0.4	0.586
Departure Headway (Hd)	6.253	8.062	7.37	7.113	6.478
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	576	442	485	504	554
Service Time	4.321	5.848	5.156	5.204	4.559
HCM Lane V/C Ratio	0.819	0.077	0.416	0.401	0.588
HCM Control Delay	31.9	11.5	15.3	14.9	18.4
HCM Lane LOS	D	B	C	B	C
HCM 95th-tile Q	8.3	0.2	2	1.9	3.8

Intersection

Intersection Delay, s/veh 10

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	250	30	10	10	20	10	10	10	10	10	10	150
Future Vol, veh/h	250	30	10	10	20	10	10	10	10	10	10	150
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	284	34	11	11	23	11	11	11	11	11	11	170
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	11.1	8.1	8.5	8.9
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	86%	25%	6%
Vol Thru, %	0%	50%	10%	50%	6%
Vol Right, %	0%	50%	3%	25%	88%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	20	290	40	170
LT Vol	10	0	250	10	10
Through Vol	0	10	30	20	10
RT Vol	0	10	10	10	150
Lane Flow Rate	11	23	330	45	193
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.019	0.033	0.426	0.06	0.238
Departure Headway (Hd)	6.111	5.252	4.659	4.717	4.439
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	585	680	771	756	807
Service Time	3.86	3	2.697	2.767	2.474
HCM Lane V/C Ratio	0.019	0.034	0.428	0.06	0.239
HCM Control Delay	9	8.2	11.1	8.1	8.9
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0.1	0.1	2.1	0.2	0.9

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Existing Plus Approved Projects PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	40	220	100	110	170	60	580	70	70	430	50
Future Volume (veh/h)	110	40	220	100	110	170	60	580	70	70	430	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1900	1900	1900	1863	1881	1881	1827	1863	1900
Adj Flow Rate, veh/h	133	48	45	120	133	162	72	699	27	84	518	53
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	1	1	0	0	0	2	1	1	4	2	2
Cap, veh/h	274	285	229	428	182	221	93	1150	490	108	1068	109
Arrive On Green	0.15	0.15	0.15	0.24	0.24	0.24	0.05	0.32	0.32	0.06	0.33	0.32
Sat Flow, veh/h	1774	1846	1483	1810	768	935	1774	3574	1524	1740	3222	328
Grp Volume(v), veh/h	133	46	47	120	0	295	72	699	27	84	284	287
Grp Sat Flow(s),veh/h/ln	1774	1787	1542	1810	0	1703	1774	1787	1524	1740	1770	1781
Q Serve(g_s), s	4.9	1.6	1.9	3.9	0.0	11.4	2.9	11.7	0.9	3.4	9.1	9.2
Cycle Q Clear(g_c), s	4.9	1.6	1.9	3.9	0.0	11.4	2.9	11.7	0.9	3.4	9.1	9.2
Prop In Lane	1.00		0.96	1.00		0.55	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	274	276	238	428	0	403	93	1150	490	108	587	590
V/C Ratio(X)	0.48	0.17	0.20	0.28	0.00	0.73	0.77	0.61	0.06	0.78	0.48	0.49
Avail Cap(c_a), veh/h	647	652	563	660	0	622	548	1656	706	537	820	825
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	26.1	26.3	22.2	0.0	25.1	33.3	20.4	16.7	32.9	19.0	19.1
Incr Delay (d2), s/veh	0.5	0.1	0.1	0.1	0.0	1.0	5.1	0.7	0.1	4.4	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.8	0.8	1.9	0.0	5.4	1.5	5.8	0.4	1.8	4.6	4.6
LnGrp Delay(d),s/veh	28.0	26.2	26.4	22.4	0.0	26.1	38.4	21.1	16.7	37.3	19.8	20.0
LnGrp LOS	C	C	C	C		C	D	C	B	D	B	B
Approach Vol, veh/h		226			415			798			655	
Approach Delay, s/veh		27.3			25.0			22.5			22.1	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	26.9		15.0	7.7	27.6		20.9				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+I), s	15.4	13.7		6.9	4.9	11.2		13.4				
Green Ext Time (p_c), s	0.1	6.3		0.5	0.1	5.1		1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			23.4									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh 16

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	150	280	0	10	40	260	0	10	10	190	20	40
Future Vol, veh/h	150	280	0	10	40	260	0	10	10	190	20	40
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	10	5	5	142	71	71	0	0	0
Mvmt Flow	172	322	0	11	46	299	0	11	11	218	23	46
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	16.1	14.2	11.7	18.6
HCM LOS	C	B	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	76%
Vol Thru, %	50%	38%	100%	0%	100%	5%	8%
Vol Right, %	50%	0%	0%	0%	0%	95%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	243	187	10	27	273	250
LT Vol	0	150	0	10	0	0	190
Through Vol	10	93	187	0	27	13	20
RT Vol	10	0	0	0	0	260	40
Lane Flow Rate	23	280	215	11	31	314	287
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.054	0.542	0.397	0.023	0.056	0.513	0.563
Departure Headway (Hd)	8.511	6.973	6.658	7.156	6.56	5.88	7.059
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	423	515	536	497	543	610	509
Service Time	6.211	4.759	4.444	4.94	4.342	3.662	4.836
HCM Lane V/C Ratio	0.054	0.544	0.401	0.022	0.057	0.515	0.564
HCM Control Delay	11.7	17.8	13.8	10.1	9.7	14.8	18.6
HCM Lane LOS	B	C	B	B	A	B	C
HCM 95th-tile Q	0.2	3.2	1.9	0.1	0.2	2.9	3.4

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Approved Projects PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			↰	↱	↰	↱	↱			
Traffic Volume (veh/h)	530	1170	0	0	1680	650	90	240	550	0	0	0
Future Volume (veh/h)	530	1170	0	0	1680	650	90	240	550	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	546	1206	0	0	1732	0	93	247	479			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	574	2706	0	0	2896	902	322	341	572			
Arrive On Green	0.17	0.76	0.00	0.00	1.00	0.00	0.18	0.18	0.18			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3150			
Grp Volume(v), veh/h	546	1206	0	0	1732	0	93	247	479			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1575			
Q Serve(g_s), s	23.6	18.5	0.0	0.0	0.0	0.0	6.8	18.6	22.0			
Cycle Q Clear(g_c), s	23.6	18.5	0.0	0.0	0.0	0.0	6.8	18.6	22.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	574	2706	0	0	2896	902	322	341	572			
V/C Ratio(X)	0.95	0.45	0.00	0.00	0.60	0.00	0.29	0.72	0.84			
Avail Cap(c_a), veh/h	574	2706	0	0	2896	902	412	436	731			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.49	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	61.9	6.7	0.0	0.0	0.0	0.0	53.0	57.8	59.3			
Incr Delay (d2), s/veh	25.8	0.5	0.0	0.0	0.5	0.0	0.2	2.7	5.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	18.3	9.2	0.0	0.0	0.1	0.0	3.3	9.9	10.0			
LnGrp Delay(d),s/veh	87.7	7.2	0.0	0.0	0.5	0.0	53.2	60.6	64.8			
LnGrp LOS	F	A			A		D	E	E			
Approach Vol, veh/h		1752			1732			819				
Approach Delay, s/veh		32.3			0.5			62.2				
Approach LOS		C			A			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		118.6			29.0	89.6		31.4				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		106.0			25.0	77.0		34.8				
Max Q Clear Time (g_c+I1), s		20.5			25.6	2.0		24.0				
Green Ext Time (p_c), s		38.9			0.0	56.1		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			25.2									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Existing Plus Approved Projects PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	🔻🔻	↑↑↑		🔻🔻	↑↑↑	🔻	🔻🔻	↑↑	🔻	🔻	↑↑	🔻
Traffic Volume (veh/h)	150	1410	160	150	1440	90	340	450	280	240	270	550
Future Volume (veh/h)	150	1410	160	150	1440	90	340	450	280	240	270	550
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.89	1.00		0.88
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	153	1439	152	153	1469	0	347	459	76	245	276	453
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	197	2109	223	201	2311	594	388	928	370	189	905	355
Arrive On Green	0.11	0.90	0.90	0.06	0.45	0.00	0.11	0.26	0.26	0.11	0.25	0.25
Sat Flow, veh/h	3442	4700	496	3442	5136	1319	3442	3574	1425	1774	3574	1403
Grp Volume(v), veh/h	153	1048	543	153	1469	0	347	459	76	245	276	453
Grp Sat Flow(s),veh/h/ln	1721	1712	1773	1721	1712	1319	1721	1787	1425	1774	1787	1403
Q Serve(g_s), s	6.5	12.2	12.2	6.6	33.1	0.0	14.9	16.4	6.3	16.0	9.4	38.0
Cycle Q Clear(g_c), s	6.5	12.2	12.2	6.6	33.1	0.0	14.9	16.4	6.3	16.0	9.4	38.0
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	197	1536	795	201	2311	594	388	928	370	189	905	355
V/C Ratio(X)	0.78	0.68	0.68	0.76	0.64	0.00	0.89	0.49	0.21	1.29	0.30	1.27
Avail Cap(c_a), veh/h	252	1536	795	597	2311	594	390	929	371	189	905	355
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	0.65	0.65	0.00	1.00	1.00	1.00	0.85	0.85	0.85
Uniform Delay (d), s/veh	65.5	4.9	4.9	69.6	31.8	0.0	65.6	47.2	43.4	67.0	45.3	56.0
Incr Delay (d2), s/veh	9.5	2.1	4.0	1.4	0.9	0.0	21.4	0.2	0.1	161.8	0.1	141.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	5.7	6.3	3.2	15.8	0.0	8.2	8.1	2.5	16.3	4.6	28.6
LnGrp Delay(d),s/veh	75.0	7.0	8.9	71.0	32.6	0.0	87.0	47.3	43.5	228.8	45.4	197.1
LnGrp LOS	E	A	A	E	C		F	D	D	F	D	F
Approach Vol, veh/h		1744			1622			882			974	
Approach Delay, s/veh		13.5			36.3			62.6			162.1	
Approach LOS		B			D			E			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.8	73.3	20.9	43.0	12.6	73.5	20.0	43.9				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.0	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+I), s	13.6	14.2	16.9	40.0	8.5	35.1	18.0	18.4				
Green Ext Time (p_c), s	0.2	28.9	0.0	0.0	0.1	23.7	0.0	2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			56.6									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Existing Plus Approved Projects PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	1780	60	140	1480	340	110	40	470	380	40	100
Future Volume (veh/h)	80	1780	60	140	1480	340	110	40	470	380	40	100
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.95	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1866	1881
Adj Flow Rate, veh/h	84	1874	60	147	1558	0	116	42	296	430	0	40
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	134	1783	57	169	2083	649	410	45	315	679	0	284
Arrive On Green	0.03	0.23	0.23	0.10	0.41	0.00	0.23	0.23	0.23	0.19	0.00	0.19
Sat Flow, veh/h	3442	5103	163	1774	5136	1599	1774	194	1364	3548	0	1485
Grp Volume(v), veh/h	84	1256	678	147	1558	0	116	0	338	430	0	40
Grp Sat Flow(s),veh/h/ln	1721	1712	1843	1774	1712	1599	1774	0	1557	1774	0	1485
Q Serve(g_s), s	3.6	52.4	52.4	12.3	38.8	0.0	8.1	0.0	32.0	16.7	0.0	3.4
Cycle Q Clear(g_c), s	3.6	52.4	52.4	12.3	38.8	0.0	8.1	0.0	32.0	16.7	0.0	3.4
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.88	1.00		1.00
Lane Grp Cap(c), veh/h	134	1196	644	169	2083	649	410	0	360	679	0	284
V/C Ratio(X)	0.63	1.05	1.05	0.87	0.75	0.00	0.28	0.00	0.94	0.63	0.00	0.14
Avail Cap(c_a), veh/h	184	1196	644	248	2083	649	414	0	363	852	0	356
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.56	0.56	0.56	0.84	0.84	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	72.0	57.4	57.4	67.0	38.0	0.0	47.5	0.0	56.7	55.8	0.0	50.4
Incr Delay (d2), s/veh	1.0	34.2	41.5	12.4	2.1	0.0	0.1	0.0	31.5	0.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	30.5	34.1	6.6	18.7	0.0	4.0	0.0	16.9	8.3	0.0	1.4
LnGrp Delay(d),s/veh	73.0	91.7	98.9	79.3	40.1	0.0	47.6	0.0	88.1	56.2	0.0	50.5
LnGrp LOS	E	F	F	E	D		D		F	E		D
Approach Vol, veh/h	2018				1705				454		470	
Approach Delay, s/veh	93.3				43.5				77.8		55.7	
Approach LOS	F				D				E		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	58.3	58.4			33.7	9.8	66.8	39.6				
Change Period (Y+Rc), s	4.0	6.0			5.0	4.0	6.0	5.0				
Max Green Setting (Gmax), s	21.0	38.0			36.0	8.0	51.0	35.0				
Max Q Clear Time (g_c+14.3), s	14.3	54.4			18.7	5.6	40.8	34.0				
Green Ext Time (p_c), s	0.0	0.0			0.9	0.0	9.3	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			69.7									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Existing Plus Approved Projects PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑	↱		↰	↱		↰	↱
Traffic Volume (veh/h)	90	2540	80	70	1640	40	190	50	380	40	20	40
Future Volume (veh/h)	90	2540	80	70	1640	40	190	50	380	40	20	40
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	94	2646	63	73	1708	41	198	52	336	42	21	10
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	0	0	0	0	0	0
Cap, veh/h	82	3170	951	82	3182	76	40	0	396	37	12	353
Arrive On Green	0.05	0.62	0.62	0.05	0.62	0.62	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1540	1774	5154	124	0	0	1605	0	48	1429
Grp Volume(v), veh/h	94	2646	63	73	1134	615	250	0	336	63	0	10
Grp Sat Flow(s), veh/h/ln	1774	1712	1540	1774	1712	1854	0	0	1605	48	0	1429
Q Serve(g_s), s	7.5	65.9	2.6	6.6	30.7	30.7	0.0	0.0	32.3	0.0	0.0	0.9
Cycle Q Clear(g_c), s	7.5	65.9	2.6	6.6	30.7	30.7	40.0	0.0	32.3	40.0	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.07	0.79		1.00	0.67		1.00
Lane Grp Cap(c), veh/h	82	3170	951	82	2113	1145	40	0	396	49	0	353
V/C Ratio(X)	1.14	0.83	0.07	0.89	0.54	0.54	6.28	0.00	0.85	1.29	0.00	0.03
Avail Cap(c_a), veh/h	82	3170	951	82	2113	1145	40	0	396	49	0	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	77.3	24.5	12.4	76.8	17.7	17.7	81.0	0.0	58.1	71.5	0.0	46.3
Incr Delay (d2), s/veh	78.0	0.3	0.0	62.2	1.0	1.8	2427.6	0.0	14.9	226.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	30.9	1.1	4.7	14.8	16.3	28.6	0.0	16.0	5.2	0.0	0.3
LnGrp Delay(d),s/veh	155.3	24.7	12.4	139.0	18.7	19.6	2508.6	0.0	73.0	297.7	0.0	46.3
LnGrp LOS	F	C	B	F	B	B	F		E	F		D
Approach Vol, veh/h	2803			1822			586			73		
Approach Delay, s/veh	28.8			23.8			1112.1			263.3		
Approach LOS	C			C			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	105.0		45.0	12.0	105.0		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	5	100.0		40.0	7.5	88.0		40.0				
Max Q Clear Time (g_c+1/3), s	10.6	67.9		42.0	9.5	32.7		42.0				
Green Ext Time (p_c), s	0.0	31.7		0.0	0.0	44.1		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	150.5											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

EPAP Plus Project AM

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	140	20	42	40	30	30	222	227	20	60	1132	310						
Future Volume (veh/h)	140	20	42	40	30	30	222	227	20	60	1132	310						
Number	7	4	14	3	8	18	5	2	12	1	6	16						
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0						
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.95	1.00		0.98						
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Adj Sat Flow, veh/h/ln	1827	1849	1900	1900	1848	1900	1827	1863	1900	1827	1863	1900						
Adj Flow Rate, veh/h	104	96	29	45	34	24	249	255	20	67	1272	337						
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89						
Percent Heavy Veh, %	4	2	2	2	2	2	4	2	2	4	2	2						
Cap, veh/h	182	142	43	57	43	30	278	2105	164	86	1453	376						
Arrive On Green	0.10	0.10	0.10	0.07	0.07	0.07	0.16	0.64	0.62	0.05	0.52	0.51						
Sat Flow, veh/h	1740	1357	410	760	574	405	1740	3313	257	1740	2767	717						
Grp Volume(v), veh/h	104	0	125	103	0	0	249	135	140	67	803	806						
Grp Sat Flow(s),veh/h/ln	1740	0	1767	1739	0	0	1740	1770	1800	1740	1770	1715						
Q Serve(g_s), s	6.7	0.0	8.0	6.9	0.0	0.0	16.5	3.5	3.6	4.5	46.5	49.7						
Cycle Q Clear(g_c), s	6.7	0.0	8.0	6.9	0.0	0.0	16.5	3.5	3.6	4.5	46.5	49.7						
Prop In Lane	1.00		0.23	0.44		0.23	1.00		0.14	1.00		0.42						
Lane Grp Cap(c), veh/h	182	0	185	130	0	0	278	1124	1144	86	929	900						
V/C Ratio(X)	0.57	0.00	0.68	0.79	0.00	0.00	0.90	0.12	0.12	0.78	0.86	0.90						
Avail Cap(c_a), veh/h	473	0	480	325	0	0	473	1124	1144	473	955	925						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00						
Uniform Delay (d), s/veh	50.2	0.0	50.8	53.5	0.0	0.0	48.5	8.5	8.5	55.3	24.3	25.4						
Incr Delay (d2), s/veh	1.1	0.0	1.6	4.1	0.0	0.0	6.3	0.1	0.1	5.6	8.5	11.3						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	3.3	0.0	4.0	3.4	0.0	0.0	8.4	1.7	1.8	2.3	24.7	26.1						
LnGrp Delay(d),s/veh	51.2	0.0	52.4	57.6	0.0	0.0	54.8	8.5	8.6	60.9	32.8	36.7						
LnGrp LOS	D		D	E			D	A	A	E	C	D						
Approach Vol, veh/h	229			103			524			1676								
Approach Delay, s/veh	51.9			57.6			30.5			35.8								
Approach LOS	D			E			C			D								
Timer	1	2	3	4	5	6	7	8										
Assigned Phs	1	2	4		5	6	8											
Phs Duration (G+Y+Rc), s	9.8	78.8	16.3		22.8	65.8	12.8											
Change Period (Y+Rc), s	4.0	5.5	4.0		4.0	5.5	4.0											
Max Green Setting (Gmax), s	32.0	62.0	32.0		32.0	62.0	22.0											
Max Q Clear Time (g_c+l1), s	6.5	5.6	10.0		18.5	51.7	8.9											
Green Ext Time (p_c), s	0.1	2.6	0.6		0.3	8.6	0.3											
Intersection Summary																		
HCM 2010 Ctrl Delay	37.0																	
HCM 2010 LOS	D																	
Notes																		

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

EPAP Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↘		↗	↘	↗	↑↑↑		↗	↑↑	
Traffic Volume (veh/h)	10	0	10	184	30	189	30	290	43	124	1010	100
Future Volume (veh/h)	10	0	10	184	30	189	30	290	43	124	1010	100
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.96	1.00		0.95	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1832	1863	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	11	0	6	202	33	84	33	319	35	136	1110	106
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	0	255	214	0	256	188	38	2249	240	177	1840	175
Arrive On Green	0.00	0.00	0.14	0.00	0.14	0.14	0.02	0.48	0.46	0.10	0.57	0.54
Sat Flow, veh/h	0	1827	1532	0	1832	1344	1740	4640	496	1740	3256	311
Grp Volume(v), veh/h	0	0	6	0	33	84	33	231	123	136	603	613
Grp Sat Flow(s),veh/h/ln	0	1827	1532	0	1832	1344	1740	1695	1745	1740	1770	1797
Q Serve(g_s), s	0.0	0.0	0.1	0.0	0.7	2.5	0.8	1.6	1.7	3.3	9.8	9.9
Cycle Q Clear(g_c), s	0.0	0.0	0.1	0.0	0.7	2.5	0.8	1.6	1.7	3.3	9.8	9.9
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.28	1.00		0.17
Lane Grp Cap(c), veh/h	0	255	214	0	256	188	38	1643	846	177	1000	1015
V/C Ratio(X)	0.00	0.00	0.03	0.00	0.13	0.45	0.88	0.14	0.15	0.77	0.60	0.60
Avail Cap(c_a), veh/h	0	1334	1119	0	1755	1288	1270	2552	1314	1270	1332	1353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	16.3	0.0	16.5	17.3	21.4	6.2	6.3	19.2	6.3	6.4
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.1	0.6	20.3	0.1	0.1	2.6	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.0	0.4	1.0	0.6	0.8	0.9	1.7	4.9	5.0
LnGrp Delay(d),s/veh	0.0	0.0	16.3	0.0	16.6	17.9	41.7	6.3	6.5	21.8	7.1	7.2
LnGrp LOS			B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		6			117			387			1352	
Approach Delay, s/veh		16.3			17.6			9.4			8.6	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.5	25.2	0.0	10.1	4.9	28.8	0.0	10.1				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+1.3), s	11.3	3.7	0.0	2.1	2.8	11.9	0.0	4.5				
Green Ext Time (p_c), s	0.2	3.3	0.0	0.0	0.0	11.7	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			9.4									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

EPAP Plus Project AM

Intersection

Intersection Delay, s/veh 59.9

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	68	40	155	253	47	120	90	70	81	270	60
Future Vol, veh/h	20	68	40	155	253	47	120	90	70	81	270	60
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	23	77	45	176	288	53	136	102	80	92	307	68
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	15.1	93.4	27.3	58.9
HCM LOS	C	F	D	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	43%	100%	0%	34%	20%
Vol Thru, %	32%	0%	63%	56%	66%
Vol Right, %	25%	0%	37%	10%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	280	20	108	455	411
LT Vol	120	20	0	155	81
Through Vol	90	0	68	253	270
RT Vol	70	0	40	47	60
Lane Flow Rate	318	23	123	517	467
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.687	0.06	0.295	1.084	0.954
Departure Headway (Hd)	8.194	9.915	9.07	7.548	7.724
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	445	363	399	481	472
Service Time	6.194	7.615	6.77	5.633	5.724
HCM Lane V/C Ratio	0.715	0.063	0.308	1.075	0.989
HCM Control Delay	27.3	13.2	15.5	93.4	58.9
HCM Lane LOS	D	B	C	F	F
HCM 95th-tile Q	5.1	0.2	1.2	16.5	11.6

Intersection

Intersection Delay, s/veh 11

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	150	20	39	0	30	10	86	26	10	10	15	340
Future Vol, veh/h	150	20	39	0	30	10	86	26	10	10	15	340
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	1	1	2	1	1	2	1	1	2	1	1
Mvmt Flow	165	22	43	0	33	11	95	29	11	11	16	374
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	11	8.9	9.7	11.7
HCM LOS	B	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	72%	0%	3%
Vol Thru, %	0%	72%	10%	75%	4%
Vol Right, %	0%	28%	19%	25%	93%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	86	36	209	40	365
LT Vol	86	0	150	0	10
Through Vol	0	26	20	30	15
RT Vol	0	10	39	10	340
Lane Flow Rate	95	40	230	44	401
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.161	0.059	0.334	0.067	0.49
Departure Headway (Hd)	6.129	5.409	5.24	5.472	4.397
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	579	654	678	658	810
Service Time	3.926	3.206	3.339	3.472	2.467
HCM Lane V/C Ratio	0.164	0.061	0.339	0.067	0.495
HCM Control Delay	10.1	8.6	11	8.9	11.7
HCM Lane LOS	B	A	B	A	B
HCM 95th-tile Q	0.6	0.2	1.5	0.2	2.7

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

EPAP Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	51	40	90	50	50	80	243	50	130	854	220
Future Volume (veh/h)	70	51	40	90	50	50	80	243	50	130	854	220
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		0.94	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1900	1863	1881	1881	1863	1881	1900
Adj Flow Rate, veh/h	76	55	7	98	54	24	87	264	19	141	928	224
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	280	500	62	290	196	87	113	1312	553	178	1146	276
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.06	0.37	0.37	0.10	0.40	0.39
Sat Flow, veh/h	1774	3171	392	1774	1200	534	1774	3574	1506	1774	2837	684
Grp Volume(v), veh/h	76	30	32	98	0	78	87	264	19	141	584	568
Grp Sat Flow(s),veh/h/ln	1774	1787	1776	1774	0	1734	1774	1787	1506	1774	1787	1734
Q Serve(g_s), s	2.9	1.1	1.2	3.7	0.0	3.0	3.7	3.8	0.6	5.9	21.9	22.0
Cycle Q Clear(g_c), s	2.9	1.1	1.2	3.7	0.0	3.0	3.7	3.8	0.6	5.9	21.9	22.0
Prop In Lane	1.00		0.22	1.00		0.31	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	280	282	280	290	0	283	113	1312	553	178	722	701
V/C Ratio(X)	0.27	0.11	0.11	0.34	0.00	0.28	0.77	0.20	0.03	0.79	0.81	0.81
Avail Cap(c_a), veh/h	609	614	610	609	0	595	516	1558	656	516	779	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	27.3	27.3	28.0	0.0	27.7	34.9	16.4	15.4	33.3	20.0	20.2
Incr Delay (d2), s/veh	0.2	0.1	0.1	0.3	0.0	0.2	4.1	0.1	0.0	3.0	6.4	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4	0.5	0.6	1.8	0.0	1.4	1.9	1.9	0.3	3.0	12.0	11.7
LnGrp Delay(d),s/veh	28.3	27.4	27.4	28.3	0.0	27.9	39.0	16.5	15.4	36.2	26.4	26.9
LnGrp LOS	C	C	C	C		C	D	B	B	D	C	C
Approach Vol, veh/h		138			176			370			1293	
Approach Delay, s/veh		27.9			28.1			21.7			27.7	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	31.8		15.9	8.8	34.6		16.4				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+17, s)	4.0	5.8		4.9	5.7	24.0		5.7				
Green Ext Time (p_c), s	0.2	2.5		0.3	0.1	5.6		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay			26.6									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh 32.2

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	40	50	10	10	160	190	0	10	10	345	10	150
Future Vol, veh/h	40	50	10	10	160	190	0	10	10	345	10	150
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	43	54	11	11	174	207	0	11	11	375	11	163
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	11.8	13	9.8	50.8
HCM LOS	B	B	A	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	68%
Vol Thru, %	50%	38%	71%	0%	100%	22%	2%
Vol Right, %	50%	0%	29%	0%	0%	78%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	65	35	10	107	243	505
LT Vol	0	40	0	10	0	0	345
Through Vol	10	25	25	0	107	53	10
RT Vol	10	0	10	0	0	190	150
Lane Flow Rate	22	71	38	11	116	264	549
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.04	0.157	0.079	0.022	0.216	0.452	0.95
Departure Headway (Hd)	6.684	8.008	7.43	7.27	6.707	6.148	6.233
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	531	445	479	490	532	582	582
Service Time	4.479	5.807	5.229	5.045	4.481	3.921	3.984
HCM Lane V/C Ratio	0.041	0.16	0.079	0.022	0.218	0.454	0.943
HCM Control Delay	9.8	12.3	10.9	10.2	11.3	13.9	50.8
HCM Lane LOS	A	B	B	B	B	B	F
HCM 95th-tile Q	0.1	0.6	0.3	0.1	0.8	2.3	12.6

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

EPAP Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↷			↷	↰	↰	↷	↰			
Traffic Volume (veh/h)	390	995	0	0	1693	600	170	581	1063	0	0	0
Future Volume (veh/h)	390	995	0	0	1693	600	170	581	1063	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	406	1036	0	0	1764	0	177	605	986			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	382	1936	0	0	1983	617	632	670	1136			
Arrive On Green	0.11	0.54	0.00	0.00	0.39	0.00	0.36	0.36	0.36			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3190			
Grp Volume(v), veh/h	406	1036	0	0	1764	0	177	605	986			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1595			
Q Serve(g_s), s	10.0	16.8	0.0	0.0	28.9	0.0	6.4	27.5	25.9			
Cycle Q Clear(g_c), s	10.0	16.8	0.0	0.0	28.9	0.0	6.4	27.5	25.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	382	1936	0	0	1983	617	632	670	1136			
V/C Ratio(X)	1.06	0.54	0.00	0.00	0.89	0.00	0.28	0.90	0.87			
Avail Cap(c_a), veh/h	382	1936	0	0	1983	617	670	711	1205			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.54	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	40.0	13.3	0.0	0.0	25.8	0.0	20.7	27.5	27.0			
Incr Delay (d2), s/veh	63.3	1.1	0.0	0.0	3.7	0.0	0.1	13.8	6.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.1	8.5	0.0	0.0	14.2	0.0	3.2	16.9	12.4			
LnGrp Delay(d),s/veh	103.3	14.4	0.0	0.0	29.5	0.0	20.8	41.3	33.3			
LnGrp LOS	F	B			C		C	D	C			
Approach Vol, veh/h		1442			1764			1768				
Approach Delay, s/veh		39.4			29.5			34.8				
Approach LOS		D			C			C				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		53.8			14.0	39.8		36.2				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		46.8			10.0	32.8		34.0				
Max Q Clear Time (g_c+I1), s		18.8			12.0	30.9		29.5				
Green Ext Time (p_c), s		17.4			0.0	1.8		2.5				
Intersection Summary												
HCM 2010 Ctrl Delay			34.3									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

EPAP Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 			 	
Traffic Volume (veh/h)	222	1536	310	410	1821	140	240	231	50	100	592	242
Future Volume (veh/h)	222	1536	310	410	1821	140	240	231	50	100	592	242
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.84	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	229	1584	297	423	1877	0	247	238	14	103	610	141
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	252	1734	323	473	2384	612	294	950	359	124	895	390
Arrive On Green	0.07	0.40	0.40	0.14	0.46	0.00	0.09	0.27	0.27	0.07	0.25	0.25
Sat Flow, veh/h	3442	4333	808	3442	5136	1319	3442	3574	1351	1774	3574	1555
Grp Volume(v), veh/h	229	1250	631	423	1877	0	247	238	14	103	610	141
Grp Sat Flow(s),veh/h/ln	1721	1712	1717	1721	1712	1319	1721	1787	1351	1774	1787	1555
Q Serve(g_s), s	9.9	51.7	52.3	18.1	46.3	0.0	10.6	7.9	1.2	8.6	23.1	11.2
Cycle Q Clear(g_c), s	9.9	51.7	52.3	18.1	46.3	0.0	10.6	7.9	1.2	8.6	23.1	11.2
Prop In Lane	1.00		0.47	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	252	1370	687	473	2384	612	294	950	359	124	895	390
V/C Ratio(X)	0.91	0.91	0.92	0.89	0.79	0.00	0.84	0.25	0.04	0.83	0.68	0.36
Avail Cap(c_a), veh/h	252	1370	687	597	2384	612	390	950	359	189	905	394
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	0.11	0.11	0.00	1.00	1.00	1.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	69.0	42.5	42.7	63.6	33.9	0.0	67.6	43.3	40.9	68.9	50.8	46.3
Incr Delay (d2), s/veh	24.8	7.6	14.2	1.6	0.3	0.0	9.3	0.1	0.0	4.7	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	25.9	27.4	8.7	22.0	0.0	5.4	3.9	0.4	4.4	11.5	4.8
LnGrp Delay(d),s/veh	93.8	50.1	56.9	65.2	34.2	0.0	76.9	43.4	40.9	73.5	51.5	46.4
LnGrp LOS	F	D	E	E	C		E	D	D	E	D	D
Approach Vol, veh/h	2110			2300			499			854		
Approach Delay, s/veh	56.9			39.9			59.9			53.3		
Approach LOS	E			D			E			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.6	66.0	16.8	42.6	15.0	75.6	14.5	44.9				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.6	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+20), s	20.1	54.3	12.6	25.1	11.9	48.3	10.6	9.9				
Green Ext Time (p_c), s	0.5	0.0	0.2	2.6	0.0	15.7	0.0	1.0				
Intersection Summary												
HCM 2010 Ctrl Delay			49.9									
HCM 2010 LOS			D									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

EPAP Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	1440	160	240	2150	424	40	31	160	272	72	101
Future Volume (veh/h)	76	1440	160	240	2150	424	40	31	160	272	72	101
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		0.93	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1870	1881
Adj Flow Rate, veh/h	79	1500	156	250	2240	0	42	32	35	179	221	44
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	133	1818	189	248	2506	780	247	110	120	357	376	294
Arrive On Green	0.01	0.13	0.13	0.14	0.49	0.00	0.14	0.14	0.14	0.20	0.20	0.20
Sat Flow, veh/h	3442	4704	489	1774	5136	1599	1774	791	865	1774	1870	1461
Grp Volume(v), veh/h	79	1091	565	250	2240	0	42	0	67	179	221	44
Grp Sat Flow(s),veh/h/ln	1721	1712	1769	1774	1712	1599	1774	0	1656	1774	1870	1461
Q Serve(g_s), s	3.4	46.6	46.7	21.0	59.4	0.0	3.1	0.0	5.4	13.4	16.1	3.7
Cycle Q Clear(g_c), s	3.4	46.6	46.7	21.0	59.4	0.0	3.1	0.0	5.4	13.4	16.1	3.7
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	133	1323	684	248	2506	780	247	0	230	357	376	294
V/C Ratio(X)	0.60	0.82	0.83	1.01	0.89	0.00	0.17	0.00	0.29	0.50	0.59	0.15
Avail Cap(c_a), veh/h	184	1323	684	248	2506	780	414	0	386	426	449	351
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.14	0.14	0.14	0.46	0.46	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	72.9	60.5	60.5	64.5	34.9	0.0	56.9	0.0	57.9	53.2	54.3	49.3
Incr Delay (d2), s/veh	0.2	0.9	1.7	40.2	2.6	0.0	0.1	0.0	0.3	0.4	0.5	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	22.3	23.2	13.1	28.6	0.0	1.5	0.0	2.5	6.7	8.3	1.5
LnGrp Delay(d),s/veh	73.1	61.4	62.3	104.7	37.5	0.0	57.1	0.0	58.2	53.6	54.8	49.4
LnGrp LOS	E	E	E	F	D		E		E	D	D	D
Approach Vol, veh/h	1735				2490		109				444	
Approach Delay, s/veh	62.2				44.2		57.8				53.8	
Approach LOS	E				D		E				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	64.0		35.2	9.8	79.2		25.9				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	21.0	38.0		36.0	8.0	51.0		35.0				
Max Q Clear Time (g_c+23.0), s	23.0	48.7		18.1	5.4	61.4		7.4				
Green Ext Time (p_c), s	0.0	0.0		1.1	0.0	0.0		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			52.0									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

EPAP Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑	↱		↰	↱		↰	↱
Traffic Volume (veh/h)	40	1652	120	90	2734	41	70	41	60	74	174	70
Future Volume (veh/h)	40	1652	120	90	2734	41	70	41	60	74	174	70
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.95	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1869	1881	1900	1876	1881
Adj Flow Rate, veh/h	42	1739	84	95	2878	42	74	43	12	78	183	39
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	54	3170	957	82	3300	48	36	13	390	29	30	347
Arrive On Green	0.03	0.62	0.62	0.05	0.63	0.63	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1550	1774	5212	76	0	54	1578	0	120	1404
Grp Volume(v), veh/h	42	1739	84	95	1885	1035	117	0	12	261	0	39
Grp Sat Flow(s), veh/h/ln	1774	1712	1550	1774	1712	1864	54	0	1578	120	0	1404
Q Serve(g_s), s	3.8	31.7	3.6	7.5	72.8	74.3	0.0	0.0	0.9	0.0	0.0	3.5
Cycle Q Clear(g_c), s	3.8	31.7	3.6	7.5	72.8	74.3	40.0	0.0	0.9	40.0	0.0	3.5
Prop In Lane	1.00		1.00	1.00		0.04	0.63		1.00	0.30		1.00
Lane Grp Cap(c), veh/h	54	3170	957	82	2168	1180	50	0	390	59	0	347
V/C Ratio(X)	0.78	0.55	0.09	1.16	0.87	0.88	2.35	0.00	0.03	4.45	0.00	0.11
Avail Cap(c_a), veh/h	82	3170	957	82	2168	1180	50	0	390	59	0	347
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.16	0.16	0.16	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.0	17.9	12.5	77.3	24.3	24.5	70.4	0.0	46.3	61.4	0.0	47.3
Incr Delay (d2), s/veh	1.8	0.1	0.0	147.7	5.1	9.4	667.1	0.0	0.0	1593.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	15.0	1.5	7.0	35.8	41.0	11.4	0.0	0.4	28.6	0.0	1.4
LnGrp Delay(d),s/veh	79.8	18.0	12.6	225.0	29.3	33.9	737.5	0.0	46.3	1654.7	0.0	47.3
LnGrp LOS	E	B	B	F	C	C	F		D	F		D
Approach Vol, veh/h	1865			3015			129			300		
Approach Delay, s/veh	19.2			37.1			673.2			1445.8		
Approach LOS	B			D			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	105.0		45.0	9.4	107.6		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	5	100.0		40.0	7.5	88.0		40.0				
Max Q Clear Time (g_c+I), s	19.5	33.7		42.0	5.8	76.3		42.0				
Green Ext Time (p_c), s	0.0	52.6		0.0	0.0	11.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	125.8											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

EPAP Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	50	26	20	40	20	428	615	50	60	319	290
Future Volume (veh/h)	280	50	26	20	40	20	428	615	50	60	319	290
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1842	1900	1900	1900	1900	1863	1881	1900	1827	1863	1900
Adj Flow Rate, veh/h	201	221	27	23	45	16	486	699	54	68	362	214
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	4	2	2	0	0	0	2	1	1	4	2	2
Cap, veh/h	311	288	35	31	60	21	524	1755	135	88	592	342
Arrive On Green	0.18	0.18	0.18	0.06	0.06	0.06	0.30	0.52	0.51	0.05	0.28	0.26
Sat Flow, veh/h	1740	1608	196	493	965	343	1774	3349	258	1740	2120	1227
Grp Volume(v), veh/h	201	0	248	84	0	0	486	373	380	68	301	275
Grp Sat Flow(s),veh/h/ln	1740	0	1805	1801	0	0	1774	1787	1820	1740	1770	1577
Q Serve(g_s), s	9.3	0.0	11.3	4.0	0.0	0.0	23.0	10.9	10.9	3.3	12.8	13.3
Cycle Q Clear(g_c), s	9.3	0.0	11.3	4.0	0.0	0.0	23.0	10.9	10.9	3.3	12.8	13.3
Prop In Lane	1.00		0.11	0.27		0.19	1.00		0.14	1.00		0.78
Lane Grp Cap(c), veh/h	311	0	323	112	0	0	524	936	954	88	494	440
V/C Ratio(X)	0.65	0.00	0.77	0.75	0.00	0.00	0.93	0.40	0.40	0.78	0.61	0.63
Avail Cap(c_a), veh/h	643	0	667	458	0	0	656	1311	1335	643	1298	1157
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	33.8	39.9	0.0	0.0	29.6	12.4	12.5	40.6	27.1	27.8
Incr Delay (d2), s/veh	0.8	0.0	1.5	3.8	0.0	0.0	15.7	0.4	0.4	5.4	1.7	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	5.8	2.1	0.0	0.0	13.5	5.4	5.5	1.7	6.5	6.0
LnGrp Delay(d),s/veh	33.8	0.0	35.3	43.7	0.0	0.0	45.3	12.8	12.9	46.0	28.8	29.9
LnGrp LOS	C		D	D			D	B	B	D	C	C
Approach Vol, veh/h		449			84			1239			644	
Approach Delay, s/veh		34.6			43.7			25.5			31.1	
Approach LOS		C			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	49.4		19.5	29.6	28.2		9.4				
Change Period (Y+Rc), s	4.0	5.5		4.0	4.0	5.5		4.0				
Max Green Setting (Gmax), s	32.0	62.0		32.0	32.0	62.0		22.0				
Max Q Clear Time (g_c+I1), s	5.3	12.9		13.3	25.0	15.3		6.0				
Green Ext Time (p_c), s	0.1	8.4		1.2	0.5	6.2		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				29.3								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

EPAP Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩		↩	↩	↩	↩		↩	↩	
Traffic Volume (veh/h)	60	30	130	93	10	263	20	770	68	65	300	10
Future Volume (veh/h)	60	30	130	93	10	263	20	770	68	65	300	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1797	1845	1863	1881	1900	1792	1845	1900
Adj Flow Rate, veh/h	69	34	78	107	11	124	23	885	72	75	345	10
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	3	3	3	2	1	1	6	3	3
Cap, veh/h	0	289	239	0	273	205	25	2299	186	92	1794	52
Arrive On Green	0.00	0.15	0.15	0.00	0.15	0.15	0.01	0.48	0.45	0.05	0.52	0.49
Sat Flow, veh/h	0	1900	1570	0	1797	1349	1774	4827	391	1707	3477	101
Grp Volume(v), veh/h	0	34	78	0	11	124	23	627	330	75	174	181
Grp Sat Flow(s),veh/h/ln	0	1900	1570	0	1797	1349	1774	1712	1794	1707	1752	1825
Q Serve(g_s), s	0.0	0.6	1.7	0.0	0.2	3.2	0.5	4.4	4.5	1.6	2.0	2.0
Cycle Q Clear(g_c), s	0.0	0.6	1.7	0.0	0.2	3.2	0.5	4.4	4.5	1.6	2.0	2.0
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.22	1.00		0.06
Lane Grp Cap(c), veh/h	0	289	239	0	273	205	25	1631	855	92	904	942
V/C Ratio(X)	0.00	0.12	0.33	0.00	0.04	0.60	0.91	0.38	0.39	0.82	0.19	0.19
Avail Cap(c_a), veh/h	0	1610	1331	0	1999	1501	1503	2992	1568	1446	1531	1595
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.8	14.3	0.0	13.7	15.0	18.6	6.3	6.4	17.7	4.9	4.9
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.0	0.0	1.1	32.4	0.2	0.4	6.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.7	0.0	0.1	1.3	0.5	2.1	2.3	0.9	1.0	1.0
LnGrp Delay(d),s/veh	0.0	13.9	14.6	0.0	13.7	16.0	51.0	6.6	6.8	24.1	5.1	5.1
LnGrp LOS		B	B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		112			135			980			430	
Approach Delay, s/veh		14.4			15.8			7.7			8.4	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	22.0	0.0	9.7	4.5	23.5	0.0	9.7				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	13.6	6.5	0.0	3.7	2.5	4.0	0.0	5.2				
Green Ext Time (p_c), s	0.1	9.7	0.0	0.2	0.0	3.2	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			9.0									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

EPAP Plus Project PM

Intersection

Intersection Delay, s/veh 34

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	167	40	69	96	55	150	190	108	84	170	40
Future Vol, veh/h	30	167	40	69	96	55	150	190	108	84	170	40
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	0	0	0	6	3	3	0	0	0
Mvmt Flow	34	188	45	78	108	62	169	213	121	94	191	45
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	18.4	19.6	56.1	23.8
HCM LOS	C	C	F	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	33%	100%	0%	31%	29%
Vol Thru, %	42%	0%	81%	44%	58%
Vol Right, %	24%	0%	19%	25%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	448	30	207	220	294
LT Vol	150	30	0	69	84
Through Vol	190	0	167	96	170
RT Vol	108	0	40	55	40
Lane Flow Rate	503	34	233	247	330
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.959	0.082	0.52	0.535	0.667
Departure Headway (Hd)	6.856	8.717	8.042	7.797	7.264
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	529	410	447	460	496
Service Time	4.926	6.497	5.822	5.886	5.346
HCM Lane V/C Ratio	0.951	0.083	0.521	0.537	0.665
HCM Control Delay	56.1	12.3	19.3	19.6	23.8
HCM Lane LOS	F	B	C	C	C
HCM 95th-tile Q	12.4	0.3	2.9	3.1	4.9

Intersection

Intersection Delay, s/veh 11.4

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	250	30	69	10	20	10	50	21	10	10	30	150
Future Vol, veh/h	250	30	69	10	20	10	50	21	10	10	30	150
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	284	34	78	11	23	11	57	24	11	11	34	170
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	13.1	8.5	9.4	9.8
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	72%	25%	5%
Vol Thru, %	0%	68%	9%	50%	16%
Vol Right, %	0%	32%	20%	25%	79%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	31	349	40	190
LT Vol	50	0	250	10	10
Through Vol	0	21	30	20	30
RT Vol	0	10	69	10	150
Lane Flow Rate	57	35	397	45	216
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.1	0.055	0.526	0.064	0.286
Departure Headway (Hd)	6.332	5.597	4.778	5.078	4.763
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	561	633	750	696	747
Service Time	4.126	3.39	2.843	3.178	2.84
HCM Lane V/C Ratio	0.102	0.055	0.529	0.065	0.289
HCM Control Delay	9.8	8.7	13.1	8.5	9.8
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0.3	0.2	3.1	0.2	1.2

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

EPAP Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	43	220	100	110	170	60	588	71	70	433	50
Future Volume (veh/h)	110	43	220	100	110	170	60	588	71	70	433	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1900	1900	1900	1863	1881	1881	1827	1863	1900
Adj Flow Rate, veh/h	133	52	45	120	133	162	72	708	27	84	522	53
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	1	1	0	0	0	2	1	1	4	2	2
Cap, veh/h	274	295	222	428	182	221	93	1154	492	108	1073	109
Arrive On Green	0.15	0.15	0.15	0.24	0.24	0.24	0.05	0.32	0.32	0.06	0.33	0.32
Sat Flow, veh/h	1774	1908	1433	1810	768	935	1774	3574	1524	1740	3225	326
Grp Volume(v), veh/h	133	48	49	120	0	295	72	708	27	84	285	290
Grp Sat Flow(s),veh/h/ln	1774	1787	1553	1810	0	1703	1774	1787	1524	1740	1770	1782
Q Serve(g_s), s	4.9	1.7	2.0	3.9	0.0	11.4	2.9	12.0	0.9	3.4	9.2	9.3
Cycle Q Clear(g_c), s	4.9	1.7	2.0	3.9	0.0	11.4	2.9	12.0	0.9	3.4	9.2	9.3
Prop In Lane	1.00		0.92	1.00		0.55	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	274	276	240	428	0	403	93	1154	492	108	589	593
V/C Ratio(X)	0.48	0.17	0.20	0.28	0.00	0.73	0.77	0.61	0.05	0.78	0.48	0.49
Avail Cap(c_a), veh/h	645	649	564	658	0	619	545	1648	703	535	816	822
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.6	26.3	26.4	22.3	0.0	25.2	33.5	20.4	16.7	33.1	19.0	19.1
Incr Delay (d2), s/veh	0.5	0.1	0.2	0.1	0.0	1.0	5.1	0.8	0.1	4.4	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.8	0.9	1.9	0.0	5.4	1.5	6.0	0.4	1.8	4.6	4.7
LnGrp Delay(d),s/veh	28.1	26.4	26.5	22.5	0.0	26.2	38.5	21.2	16.8	37.5	19.9	20.0
LnGrp LOS	C	C	C	C		C	D	C	B	D	B	B
Approach Vol, veh/h	230		415			807			659			
Approach Delay, s/veh	27.4		25.1			22.6			22.2			
Approach LOS	C		C			C			C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	8.5	27.1			15.1	7.8	27.8	20.9				
Change Period (Y+Rc), s	4.0	5.0			4.0	4.0	5.0	4.0				
Max Green Setting (Gmax), s	27.0	32.0			26.0	22.0	32.0	26.0				
Max Q Clear Time (g_c+I), s	15.4	14.0			6.9	4.9	11.3	13.4				
Green Ext Time (p_c), s	0.1	6.4			0.5	0.1	5.1	1.2				
Intersection Summary												
HCM 2010 Ctrl Delay			23.5									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh 17.9

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Vol, veh/h	150	280	0	10	40	288	0	10	10	209	20	40
Future Vol, veh/h	150	280	0	10	40	288	0	10	10	209	20	40
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	10	5	5	142	71	71	0	0	0
Mvmt Flow	172	322	0	11	46	331	0	11	11	240	23	46
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	17.1	16.5	12	21.5
HCM LOS	C	C	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	78%
Vol Thru, %	50%	38%	100%	0%	100%	4%	7%
Vol Right, %	50%	0%	0%	0%	0%	96%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	243	187	10	27	301	269
LT Vol	0	150	0	10	0	0	209
Through Vol	10	93	187	0	27	13	20
RT Vol	10	0	0	0	0	288	40
Lane Flow Rate	23	280	215	11	31	346	309
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.056	0.566	0.415	0.024	0.058	0.589	0.626
Departure Headway (Hd)	8.749	7.283	6.967	7.403	6.805	6.12	7.288
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	409	495	517	485	528	592	498
Service Time	6.502	5.024	4.708	5.124	4.525	3.841	5.004
HCM Lane V/C Ratio	0.056	0.566	0.416	0.023	0.059	0.584	0.62
HCM Control Delay	12	19.1	14.6	10.3	9.9	17.3	21.5
HCM Lane LOS	B	C	B	B	A	C	C
HCM 95th-tile Q	0.2	3.5	2	0.1	0.2	3.8	4.2

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

EPAP Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↷			↷	↷	↰	↷	↷			
Traffic Volume (veh/h)	531	1188	0	0	1692	650	90	242	558	0	0	0
Future Volume (veh/h)	531	1188	0	0	1692	650	90	242	558	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	547	1225	0	0	1744	0	93	249	490			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	574	2696	0	0	2881	897	327	347	581			
Arrive On Green	0.17	0.75	0.00	0.00	1.00	0.00	0.18	0.18	0.18			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3151			
Grp Volume(v), veh/h	547	1225	0	0	1744	0	93	249	490			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1576			
Q Serve(g_s), s	23.6	19.2	0.0	0.0	0.0	0.0	6.8	18.7	22.5			
Cycle Q Clear(g_c), s	23.6	19.2	0.0	0.0	0.0	0.0	6.8	18.7	22.5			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	574	2696	0	0	2881	897	327	347	581			
V/C Ratio(X)	0.95	0.45	0.00	0.00	0.61	0.00	0.28	0.72	0.84			
Avail Cap(c_a), veh/h	574	2696	0	0	2881	897	412	436	731			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.49	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	61.9	6.9	0.0	0.0	0.0	0.0	52.7	57.5	59.1			
Incr Delay (d2), s/veh	26.2	0.6	0.0	0.0	0.5	0.0	0.2	2.7	6.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	18.3	9.6	0.0	0.0	0.1	0.0	3.3	9.9	10.3			
LnGrp Delay(d),s/veh	88.1	7.4	0.0	0.0	0.5	0.0	52.8	60.2	65.2			
LnGrp LOS	F	A			A		D	E	E			
Approach Vol, veh/h		1772			1744			832				
Approach Delay, s/veh		32.3			0.5			62.3				
Approach LOS		C			A			E				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		118.2			29.0	89.2		31.8				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		106.0			25.0	77.0		34.8				
Max Q Clear Time (g_c+I1), s		21.2			25.6	2.0		24.5				
Green Ext Time (p_c), s		39.8			0.0	56.5		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			25.3									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary 8: Oak Road & Treat Blvd

EPAP Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 			 	
Traffic Volume (veh/h)	157	1428	160	150	1450	90	340	452	280	240	272	552
Future Volume (veh/h)	157	1428	160	150	1450	90	340	452	280	240	272	552
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.89	1.00		0.88
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	160	1457	152	153	1480	0	347	461	76	245	278	455
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	203	2112	220	201	2301	591	388	928	370	189	905	355
Arrive On Green	0.12	0.90	0.90	0.06	0.45	0.00	0.11	0.26	0.26	0.11	0.25	0.25
Sat Flow, veh/h	3442	4707	491	3442	5136	1319	3442	3574	1425	1774	3574	1403
Grp Volume(v), veh/h	160	1060	549	153	1480	0	347	461	76	245	278	455
Grp Sat Flow(s),veh/h/ln	1721	1712	1774	1721	1712	1319	1721	1787	1425	1774	1787	1403
Q Serve(g_s), s	6.8	12.5	12.5	6.6	33.5	0.0	14.9	16.4	6.3	16.0	9.4	38.0
Cycle Q Clear(g_c), s	6.8	12.5	12.5	6.6	33.5	0.0	14.9	16.4	6.3	16.0	9.4	38.0
Prop In Lane	1.00		0.28	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	1536	796	201	2301	591	388	928	370	189	905	355
V/C Ratio(X)	0.79	0.69	0.69	0.76	0.64	0.00	0.89	0.50	0.21	1.29	0.31	1.28
Avail Cap(c_a), veh/h	252	1536	796	597	2301	591	390	929	371	189	905	355
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.64	0.64	0.00	1.00	1.00	1.00	0.85	0.85	0.85
Uniform Delay (d), s/veh	65.2	4.9	4.9	69.6	32.1	0.0	65.6	47.2	43.4	67.0	45.3	56.0
Incr Delay (d2), s/veh	10.5	2.2	4.1	1.4	0.9	0.0	21.4	0.2	0.1	161.8	0.1	143.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	5.7	6.4	3.2	15.9	0.0	8.2	8.2	2.5	16.3	4.7	28.9
LnGrp Delay(d),s/veh	75.7	7.0	9.0	71.0	33.0	0.0	87.0	47.4	43.5	228.8	45.4	199.4
LnGrp LOS	E	A	A	E	C		F	D	D	F	D	F
Approach Vol, veh/h	1769			1633			884			978		
Approach Delay, s/veh	13.9			36.6			62.6			163.0		
Approach LOS	B			D			E			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.8	73.3	20.9	43.0	12.9	73.2	20.0	43.9				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	26.6	50.0	17.0	38.0	11.0	65.0	16.0	39.0				
Max Q Clear Time (g_c+I), s	19.6	14.5	16.9	40.0	8.8	35.5	18.0	18.4				
Green Ext Time (p_c), s	0.2	28.9	0.0	0.0	0.1	23.5	0.0	2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			56.8									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

EPAP Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  					 	 	
Traffic Volume (veh/h)	98	1780	60	140	1480	348	110	42	470	388	42	110
Future Volume (veh/h)	98	1780	60	140	1480	348	110	42	470	388	42	110
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.95	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1866	1881
Adj Flow Rate, veh/h	103	1874	60	147	1558	0	116	44	303	439	0	45
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	146	1765	56	169	2047	637	414	46	317	683	0	286
Arrive On Green	0.03	0.23	0.23	0.10	0.40	0.00	0.23	0.23	0.23	0.19	0.00	0.19
Sat Flow, veh/h	3442	5103	163	1774	5136	1599	1774	198	1361	3548	0	1485
Grp Volume(v), veh/h	103	1256	678	147	1558	0	116	0	347	439	0	45
Grp Sat Flow(s),veh/h/ln	1721	1712	1843	1774	1712	1599	1774	0	1559	1774	0	1485
Q Serve(g_s), s	4.5	51.9	51.9	12.3	39.3	0.0	8.0	0.0	32.9	17.1	0.0	3.8
Cycle Q Clear(g_c), s	4.5	51.9	51.9	12.3	39.3	0.0	8.0	0.0	32.9	17.1	0.0	3.8
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.87	1.00		1.00
Lane Grp Cap(c), veh/h	146	1184	637	169	2047	637	414	0	363	683	0	286
V/C Ratio(X)	0.70	1.06	1.06	0.87	0.76	0.00	0.28	0.00	0.95	0.64	0.00	0.16
Avail Cap(c_a), veh/h	184	1184	637	248	2047	637	414	0	364	852	0	356
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.55	0.55	0.55	0.83	0.83	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	71.9	57.6	57.6	67.0	38.9	0.0	47.2	0.0	56.7	55.8	0.0	50.4
Incr Delay (d2), s/veh	3.0	37.9	44.9	12.3	2.3	0.0	0.1	0.0	35.1	0.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	30.8	34.4	6.6	19.0	0.0	4.0	0.0	17.7	8.5	0.0	1.6
LnGrp Delay(d),s/veh	75.0	95.5	102.5	79.3	41.2	0.0	47.3	0.0	91.8	56.3	0.0	50.5
LnGrp LOS	E	F	F	E	D		D		F	E		D
Approach Vol, veh/h	2037				1705				463		484	
Approach Delay, s/veh	96.8				44.5				80.7		55.8	
Approach LOS	F				D				F		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	18.3	57.9			33.9	10.4	65.8	40.0				
Change Period (Y+Rc), s	4.0	6.0			5.0	4.0	6.0	5.0				
Max Green Setting (Gmax), s	21.0	38.0			36.0	8.0	51.0	35.0				
Max Q Clear Time (g_c+14.3)	14.3	53.9			19.1	6.5	41.3	34.9				
Green Ext Time (p_c), s	0.0	0.0			0.9	0.0	8.9	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			72.0									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

EPAP Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	2548	80	70	1648	48	190	54	380	43	23	40
Future Volume (veh/h)	90	2548	80	70	1648	48	190	54	380	43	23	40
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	94	2654	63	73	1717	48	198	56	336	45	24	10
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	0	0	0	0	0	0
Cap, veh/h	82	3170	951	82	3167	88	40	0	396	37	13	353
Arrive On Green	0.05	0.62	0.62	0.05	0.62	0.62	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	5136	1540	1774	5130	143	0	0	1605	0	51	1429
Grp Volume(v), veh/h	94	2654	63	73	1146	619	254	0	336	69	0	10
Grp Sat Flow(s), veh/h/ln	1774	1712	1540	1774	1712	1850	0	0	1605	51	0	1429
Q Serve(g_s), s	7.5	66.3	2.6	6.6	31.2	31.2	0.0	0.0	32.3	0.0	0.0	0.9
Cycle Q Clear(g_c), s	7.5	66.3	2.6	6.6	31.2	31.2	40.0	0.0	32.3	40.0	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.08	0.78		1.00	0.65		1.00
Lane Grp Cap(c), veh/h	82	3170	951	82	2113	1142	40	0	396	49	0	353
V/C Ratio(X)	1.14	0.84	0.07	0.89	0.54	0.54	6.42	0.00	0.85	1.40	0.00	0.03
Avail Cap(c_a), veh/h	82	3170	951	82	2113	1142	40	0	396	49	0	353
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	77.3	24.6	12.4	76.8	17.8	17.8	81.0	0.0	58.1	71.0	0.0	46.3
Incr Delay (d2), s/veh	78.0	0.3	0.0	62.2	1.0	1.9	2493.1	0.0	14.9	267.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	31.3	1.1	4.7	14.9	16.4	29.2	0.0	16.0	5.9	0.0	0.3
LnGrp Delay(d),s/veh	155.3	24.8	12.4	139.0	18.8	19.7	2574.1	0.0	73.0	338.1	0.0	46.3
LnGrp LOS	F	C	B	F	B	B	F		E	F		D
Approach Vol, veh/h	2811			1838			590			79		
Approach Delay, s/veh	28.9			23.9			1149.8			301.2		
Approach LOS	C			C			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	105.0		45.0	12.0	105.0		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	5	100.0		40.0	7.5	88.0		40.0				
Max Q Clear Time (g_c+I), s	19.6	68.3		42.0	9.5	33.2		42.0				
Green Ext Time (p_c), s	0.0	31.3		0.0	0.0	44.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	155.6											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative No Project AM

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	150	20	50	50	30	30	230	230	20	60	1210	340						
Future Volume (veh/h)	150	20	50	50	30	30	230	230	20	60	1210	340						
Number	7	4	14	3	8	18	5	2	12	1	6	16						
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0						
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.95	1.00		0.98						
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Adj Sat Flow, veh/h/ln	1827	1850	1900	1900	1846	1900	1827	1863	1900	1827	1863	1900						
Adj Flow Rate, veh/h	113	101	35	56	34	26	258	258	20	67	1360	369						
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0						
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89						
Percent Heavy Veh, %	4	2	2	2	2	2	4	2	2	4	2	2						
Cap, veh/h	184	138	48	61	37	28	280	2173	167	85	1498	394						
Arrive On Green	0.11	0.11	0.11	0.07	0.07	0.07	0.16	0.66	0.64	0.05	0.54	0.53						
Sat Flow, veh/h	1740	1307	453	838	509	389	1740	3316	255	1740	2758	725						
Grp Volume(v), veh/h	113	0	136	116	0	0	258	137	141	67	857	872						
Grp Sat Flow(s),veh/h/ln	1740	0	1759	1736	0	0	1740	1770	1801	1740	1770	1713						
Q Serve(g_s), s	8.5	0.0	10.2	9.1	0.0	0.0	20.0	3.9	4.0	5.2	58.7	64.9						
Cycle Q Clear(g_c), s	8.5	0.0	10.2	9.1	0.0	0.0	20.0	3.9	4.0	5.2	58.7	64.9						
Prop In Lane	1.00		0.26	0.48		0.22	1.00		0.14	1.00		0.42						
Lane Grp Cap(c), veh/h	184	0	186	127	0	0	280	1160	1181	85	961	931						
V/C Ratio(X)	0.61	0.00	0.73	0.91	0.00	0.00	0.92	0.12	0.12	0.79	0.89	0.94						
Avail Cap(c_a), veh/h	331	0	334	127	0	0	292	1160	1181	153	970	939						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00						
Uniform Delay (d), s/veh	58.5	0.0	59.3	63.0	0.0	0.0	56.5	8.8	8.9	64.4	27.7	29.4						
Incr Delay (d2), s/veh	1.2	0.0	2.1	53.5	0.0	0.0	31.2	0.1	0.1	6.0	10.6	16.4						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	4.1	0.0	5.1	6.2	0.0	0.0	12.0	2.0	2.0	2.7	31.4	34.8						
LnGrp Delay(d),s/veh	59.7	0.0	61.3	116.4	0.0	0.0	87.7	8.9	8.9	70.4	38.3	45.8						
LnGrp LOS	E		E	F			F	A	A	E	D	D						
Approach Vol, veh/h	249				116			536			1796							
Approach Delay, s/veh	60.6				116.4			46.8			43.2							
Approach LOS	E				F			D			D							
Timer	1	2	3	4	5	6	7	8										
Assigned Phs	1	2			4	5	6	8										
Phs Duration (G+Y+Rc), s	10.7	93.7			18.5	26.0	78.3	14.0										
Change Period (Y+Rc), s	4.0	5.5			4.0	4.0	5.5	4.0										
Max Green Setting (Gmax), s	12.0	84.5			26.0	23.0	73.5	10.0										
Max Q Clear Time (g_c+I1), s	7.2	6.0			12.2	22.0	66.9	11.1										
Green Ext Time (p_c), s	0.0	2.6			0.6	0.0	5.9	0.0										
Intersection Summary																		
HCM 2010 Ctrl Delay	48.7																	
HCM 2010 LOS	D																	
Notes																		

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Cumulative No Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩		↩	↩	↩	↩		↩	↩	
Traffic Volume (veh/h)	10	0	10	200	30	180	30	310	50	120	1090	110
Future Volume (veh/h)	10	0	10	200	30	180	30	310	50	120	1090	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1832	1863	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	11	0	6	220	33	68	33	341	41	132	1198	117
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	0	232	194	0	233	170	38	2327	272	172	1898	185
Arrive On Green	0.00	0.00	0.13	0.00	0.13	0.13	0.02	0.51	0.48	0.10	0.58	0.56
Sat Flow, veh/h	0	1827	1527	0	1832	1338	1740	4590	537	1740	3249	317
Grp Volume(v), veh/h	0	0	6	0	33	68	33	249	133	132	651	664
Grp Sat Flow(s),veh/h/ln	0	1827	1527	0	1832	1338	1740	1695	1736	1740	1770	1796
Q Serve(g_s), s	0.0	0.0	0.2	0.0	0.7	2.1	0.9	1.8	1.9	3.3	10.9	11.0
Cycle Q Clear(g_c), s	0.0	0.0	0.2	0.0	0.7	2.1	0.9	1.8	1.9	3.3	10.9	11.0
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.31	1.00		0.18
Lane Grp Cap(c), veh/h	0	232	194	0	233	170	38	1719	880	172	1034	1049
V/C Ratio(X)	0.00	0.00	0.03	0.00	0.14	0.40	0.88	0.15	0.15	0.77	0.63	0.63
Avail Cap(c_a), veh/h	0	1300	1087	0	1711	1250	1239	2489	1274	1239	1299	1318
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	17.2	0.0	17.4	18.0	21.9	5.9	6.0	19.8	6.1	6.2
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.1	0.6	20.0	0.1	0.1	2.7	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.0	0.4	0.8	0.6	0.8	0.9	1.7	5.5	5.6
LnGrp Delay(d),s/veh	0.0	0.0	17.2	0.0	17.5	18.6	42.0	6.0	6.1	22.5	7.1	7.2
LnGrp LOS			B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		6			101			415			1447	
Approach Delay, s/veh		17.2			18.3			8.9			8.5	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.4	26.8	0.0	9.7	5.0	30.3	0.0	9.7				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+1.5), s	15.3	3.9	0.0	2.2	2.9	13.0	0.0	4.1				
Green Ext Time (p_c), s	0.2	3.6	0.0	0.0	0.0	12.2	0.0	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			9.1									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Cumulative No Project AM

Intersection

Intersection Delay, s/veh 56.2

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	60	50	130	240	50	120	90	60	80	290	70
Future Vol, veh/h	20	60	50	130	240	50	120	90	60	80	290	70
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	23	68	57	148	273	57	136	102	68	91	330	80
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	15.1	70	26.5	73.4
HCM LOS	C	F	D	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	44%	100%	0%	31%	18%
Vol Thru, %	33%	0%	55%	57%	66%
Vol Right, %	22%	0%	45%	12%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	270	20	110	420	440
LT Vol	120	20	0	130	80
Through Vol	90	0	60	240	290
RT Vol	60	0	50	50	70
Lane Flow Rate	307	23	125	477	500
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.675	0.061	0.303	1.001	1.018
Departure Headway (Hd)	8.146	9.885	8.979	7.734	7.523
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	448	365	403	472	485
Service Time	6.146	7.585	6.679	5.734	5.523
HCM Lane V/C Ratio	0.685	0.063	0.31	1.011	1.031
HCM Control Delay	26.5	13.2	15.5	70	73.4
HCM Lane LOS	D	B	C	F	F
HCM 95th-tile Q	4.9	0.2	1.3	13.2	14.1

Intersection

Intersection Delay, s/veh 10.8

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	160	30	20	0	30	10	20	10	10	10	10	360
Future Vol, veh/h	160	30	20	0	30	10	20	10	10	10	10	360
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	1	1	2	1	1	2	1	1	2	1	1
Mvmt Flow	176	33	22	0	33	11	22	11	11	11	11	396
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	10.6	8.5	8.7	11.4
HCM LOS	B	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	76%	0%	3%
Vol Thru, %	0%	50%	14%	75%	3%
Vol Right, %	0%	50%	10%	25%	95%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	20	210	40	380
LT Vol	20	0	160	0	10
Through Vol	0	10	30	30	10
RT Vol	0	10	20	10	360
Lane Flow Rate	22	22	231	44	418
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.037	0.032	0.326	0.062	0.493
Departure Headway (Hd)	6.131	5.254	5.093	5.107	4.247
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	581	677	702	694	848
Service Time	3.899	3.022	3.164	3.195	2.287
HCM Lane V/C Ratio	0.038	0.032	0.329	0.063	0.493
HCM Control Delay	9.1	8.2	10.6	8.5	11.4
HCM Lane LOS	A	A	B	A	B
HCM 95th-tile Q	0.1	0.1	1.4	0.2	2.8

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Cumulative No Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	50	50	100	60	50	80	260	50	140	920	230
Future Volume (veh/h)	70	50	50	100	60	50	80	260	50	140	920	230
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		0.94	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1900	1863	1881	1881	1863	1881	1900
Adj Flow Rate, veh/h	76	54	9	109	65	29	87	283	18	152	1000	235
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	277	476	76	295	200	89	113	1304	549	190	1167	273
Arrive On Green	0.16	0.16	0.16	0.17	0.17	0.17	0.06	0.36	0.36	0.11	0.41	0.40
Sat Flow, veh/h	1774	3047	490	1774	1199	535	1774	3574	1505	1774	2856	669
Grp Volume(v), veh/h	76	31	32	109	0	94	87	283	18	152	624	611
Grp Sat Flow(s),veh/h/ln	1774	1787	1749	1774	0	1734	1774	1787	1505	1774	1787	1738
Q Serve(g_s), s	2.9	1.2	1.2	4.3	0.0	3.7	3.8	4.3	0.6	6.5	24.8	25.0
Cycle Q Clear(g_c), s	2.9	1.2	1.2	4.3	0.0	3.7	3.8	4.3	0.6	6.5	24.8	25.0
Prop In Lane	1.00		0.28	1.00		0.31	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	277	279	273	295	0	289	113	1304	549	190	730	710
V/C Ratio(X)	0.27	0.11	0.12	0.37	0.00	0.33	0.77	0.22	0.03	0.80	0.86	0.86
Avail Cap(c_a), veh/h	591	595	583	591	0	578	500	1512	637	500	756	735
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	28.3	28.3	28.9	0.0	28.7	36.0	17.1	15.9	34.0	21.0	21.2
Incr Delay (d2), s/veh	0.2	0.1	0.1	0.3	0.0	0.2	4.1	0.1	0.0	2.9	9.6	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.6	0.6	2.1	0.0	1.8	2.0	2.1	0.3	3.4	14.1	13.9
LnGrp Delay(d),s/veh	29.2	28.3	28.4	29.2	0.0	28.9	40.1	17.2	16.0	36.9	30.6	31.5
LnGrp LOS	C	C	C	C		C	D	B	B	D	C	C
Approach Vol, veh/h	139			203			388			1387		
Approach Delay, s/veh	28.8			29.0			22.3			31.7		
Approach LOS	C			C			C			C		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.4	32.5		16.2	9.0	35.9		17.0				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+1.5), s	19.5	6.3		4.9	5.8	27.0		6.3				
Green Ext Time (p_c), s	0.2	2.7		0.3	0.1	3.8		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay	29.5											
HCM 2010 LOS	C											

Intersection

Intersection Delay, s/veh 31.8

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔			↔			↔	
Traffic Vol, veh/h	40	50	10	10	180	200	0	10	10	330	10	160
Future Vol, veh/h	40	50	10	10	180	200	0	10	10	330	10	160
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	43	54	11	11	196	217	0	11	11	359	11	174
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	11.9	13.6	9.9	50.9
HCM LOS	B	B	A	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	66%
Vol Thru, %	50%	38%	71%	0%	100%	23%	2%
Vol Right, %	50%	0%	29%	0%	0%	77%	32%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	65	35	10	120	260	500
LT Vol	0	40	0	10	0	0	330
Through Vol	10	25	25	0	120	60	10
RT Vol	10	0	10	0	0	200	160
Lane Flow Rate	22	71	38	11	130	283	543
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.042	0.161	0.08	0.022	0.243	0.483	0.949
Departure Headway (Hd)	6.887	8.181	7.601	7.268	6.704	6.154	6.287
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	523	441	474	490	532	582	576
Service Time	4.587	5.883	5.303	5.052	4.488	3.936	4.045
HCM Lane V/C Ratio	0.042	0.161	0.08	0.022	0.244	0.486	0.943
HCM Control Delay	9.9	12.4	11	10.2	11.7	14.6	50.9
HCM Lane LOS	A	B	B	B	B	B	F
HCM 95th-tile Q	0.1	0.6	0.3	0.1	0.9	2.6	12.5

HCM 2010 Signalized Intersection Summary 7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative No Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	420	1070	0	0	1810	640	180	620	1150	0	0	0
Future Volume (veh/h)	420	1070	0	0	1810	640	180	620	1150	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	438	1115	0	0	1885	0	188	646	1094			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	379	2005	0	0	2111	657	616	653	1107			
Arrive On Green	0.11	0.56	0.00	0.00	0.41	0.00	0.35	0.35	0.35			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3190			
Grp Volume(v), veh/h	438	1115	0	0	1885	0	188	646	1094			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1595			
Q Serve(g_s), s	11.0	19.9	0.0	0.0	34.2	0.0	7.7	34.2	34.1			
Cycle Q Clear(g_c), s	11.0	19.9	0.0	0.0	34.2	0.0	7.7	34.2	34.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	379	2005	0	0	2111	657	616	653	1107			
V/C Ratio(X)	1.16	0.56	0.00	0.00	0.89	0.00	0.31	0.99	0.99			
Avail Cap(c_a), veh/h	379	2005	0	0	2111	657	616	653	1107			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.39	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	44.5	14.0	0.0	0.0	27.4	0.0	23.8	32.5	32.5			
Incr Delay (d2), s/veh	96.3	1.1	0.0	0.0	2.6	0.0	0.1	32.5	24.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	10.3	10.1	0.0	0.0	16.6	0.0	3.8	23.5	18.6			
LnGrp Delay(d),s/veh	140.8	15.1	0.0	0.0	30.1	0.0	24.0	64.9	56.6			
LnGrp LOS	F	B			C		C	E	E			
Approach Vol, veh/h	1553				1885				1928			
Approach Delay, s/veh	50.6				30.1				56.2			
Approach LOS	D				C				E			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2				5	6			8			
Phs Duration (G+Y+Rc), s	61.1				15.0	46.1			38.9			
Change Period (Y+Rc), s	5.0				4.0	5.0			4.2			
Max Green Setting (Gmax), s	56.1				11.0	41.1			34.7			
Max Q Clear Time (g_c+I1), s	21.9				13.0	36.2			36.2			
Green Ext Time (p_c), s	21.4				0.0	4.8			0.0			
Intersection Summary												
HCM 2010 Ctrl Delay			45.4									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Cumulative No Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 		 	 	
Traffic Volume (veh/h)	230	1660	330	450	1950	150	260	250	50	110	640	260
Future Volume (veh/h)	230	1660	330	450	1950	150	260	250	50	110	640	260
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.84	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	237	1711	317	464	2010	0	268	258	14	113	660	160
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	283	1751	321	451	2319	596	261	926	349	135	927	404
Arrive On Green	0.08	0.40	0.40	0.13	0.45	0.00	0.08	0.26	0.26	0.08	0.26	0.26
Sat Flow, veh/h	3442	4346	797	3442	5136	1319	3442	3574	1345	1774	3574	1556
Grp Volume(v), veh/h	237	1344	684	464	2010	0	268	258	14	113	660	160
Grp Sat Flow(s),veh/h/ln	1721	1712	1719	1721	1712	1319	1721	1787	1345	1774	1787	1556
Q Serve(g_s), s	9.8	56.0	57.2	19.0	51.1	0.0	11.0	8.4	1.1	9.1	24.3	12.3
Cycle Q Clear(g_c), s	9.8	56.0	57.2	19.0	51.1	0.0	11.0	8.4	1.1	9.1	24.3	12.3
Prop In Lane	1.00		0.46	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	1379	693	451	2319	596	261	926	349	135	927	404
V/C Ratio(X)	0.84	0.97	0.99	1.03	0.87	0.00	1.03	0.28	0.04	0.84	0.71	0.40
Avail Cap(c_a), veh/h	309	1379	693	451	2319	596	261	926	349	159	937	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	0.09	0.09	0.00	1.00	1.00	1.00	0.21	0.21	0.21
Uniform Delay (d), s/veh	65.6	42.6	42.9	63.0	35.8	0.0	67.0	42.9	40.2	66.1	48.8	44.3
Incr Delay (d2), s/veh	10.6	13.5	23.4	20.9	0.5	0.0	62.7	0.1	0.0	6.3	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	28.9	31.7	10.3	24.3	0.0	7.5	4.1	0.4	4.7	12.1	5.3
LnGrp Delay(d),s/veh	76.2	56.1	66.3	83.9	36.3	0.0	129.8	43.0	40.2	72.4	49.3	44.4
LnGrp LOS	E	E	E	F	D		F	D	D	E	D	D
Approach Vol, veh/h	2265				2474		540				933	
Approach Delay, s/veh	61.3				45.2		86.0				51.2	
Approach LOS	E				D		F				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.0	64.4	15.0	42.6	15.9	71.5	15.0	42.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	19.0	58.0	11.0	38.0	13.0	64.0	13.0	36.0				
Max Q Clear Time (g_c+Q1), s	21.0	59.2	13.0	26.3	11.8	53.1	11.1	10.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.1	10.5	0.0	1.1				
Intersection Summary												
HCM 2010 Ctrl Delay			55.5									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Cumulative No Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  					 	 	
Traffic Volume (veh/h)	80	1560	170	260	2320	450	40	30	170	280	80	80
Future Volume (veh/h)	80	1560	170	260	2320	450	40	30	170	280	80	80
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		0.93	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1871	1881
Adj Flow Rate, veh/h	83	1625	166	271	2417	0	42	31	37	188	229	22
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	133	1813	185	248	2495	777	247	105	125	360	379	296
Arrive On Green	0.04	0.38	0.38	0.28	0.97	0.00	0.14	0.14	0.14	0.20	0.20	0.20
Sat Flow, veh/h	3442	4714	481	1774	5136	1599	1774	751	896	1774	1871	1462
Grp Volume(v), veh/h	83	1179	612	271	2417	0	42	0	68	188	229	22
Grp Sat Flow(s),veh/h/ln	1721	1712	1771	1774	1712	1599	1774	0	1648	1774	1871	1462
Q Serve(g_s), s	3.6	48.5	48.7	21.0	34.1	0.0	3.1	0.0	5.6	14.2	16.7	1.8
Cycle Q Clear(g_c), s	3.6	48.5	48.7	21.0	34.1	0.0	3.1	0.0	5.6	14.2	16.7	1.8
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	133	1317	681	248	2495	777	247	0	230	360	379	296
V/C Ratio(X)	0.62	0.90	0.90	1.09	0.97	0.00	0.17	0.00	0.30	0.52	0.60	0.07
Avail Cap(c_a), veh/h	138	1317	681	248	2495	777	414	0	384	426	449	351
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.11	0.11	0.11	0.30	0.30	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.0	43.3	43.4	54.0	1.6	0.0	56.9	0.0	57.9	53.3	54.3	48.4
Incr Delay (d2), s/veh	0.7	1.3	2.5	58.9	4.9	0.0	0.1	0.0	0.3	0.4	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	23.2	24.3	14.3	10.1	0.0	1.5	0.0	2.5	7.0	8.7	0.7
LnGrp Delay(d),s/veh	71.7	44.6	45.9	112.9	6.5	0.0	57.0	0.0	58.2	53.8	55.0	48.4
LnGrp LOS	E	D	D	F	A		E		E	D	E	D
Approach Vol, veh/h	1874			2688			110			439		
Approach Delay, s/veh	46.3			17.2			57.7			54.2		
Approach LOS	D			B			E			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	63.7		35.4	9.8	78.9		25.9				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	21.0	38.0		36.0	6.0	53.0		35.0				
Max Q Clear Time (g_c+23.0), s	23.0	50.7		18.7	5.6	36.1		7.6				
Green Ext Time (p_c), s	0.0	0.0		1.1	0.0	16.7		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	31.9											
HCM 2010 LOS	C											
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Cumulative No Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑	↱		↰	↱		↰	↱
Traffic Volume (veh/h)	40	1780	130	100	2950	50	70	50	60	80	190	80
Future Volume (veh/h)	40	1780	130	100	2950	50	70	50	60	80	190	80
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.95	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1870	1881	1900	1876	1881
Adj Flow Rate, veh/h	42	1874	92	105	3105	52	74	53	14	84	200	50
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	54	2904	875	126	3152	52	38	18	421	31	32	375
Arrive On Green	0.06	1.00	1.00	0.07	0.61	0.61	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1774	5136	1548	1774	5198	86	0	67	1579	0	121	1406
Grp Volume(v), veh/h	42	1874	92	105	2037	1120	127	0	14	284	0	50
Grp Sat Flow(s), veh/h/ln	1774	1712	1548	1774	1712	1861	67	0	1579	121	0	1406
Q Serve(g_s), s	3.5	0.0	0.0	8.8	86.8	89.2	0.0	0.0	1.0	0.0	0.0	4.1
Cycle Q Clear(g_c), s	3.5	0.0	0.0	8.8	86.8	89.2	40.0	0.0	1.0	40.0	0.0	4.1
Prop In Lane	1.00		1.00	1.00		0.05	0.58		1.00	0.30		1.00
Lane Grp Cap(c), veh/h	54	2904	875	126	2076	1128	56	0	421	63	0	375
V/C Ratio(X)	0.78	0.65	0.11	0.83	0.98	0.99	2.27	0.00	0.03	4.48	0.00	0.13
Avail Cap(c_a), veh/h	56	2904	875	195	2076	1128	56	0	421	63	0	375
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	70.0	0.0	0.0	68.8	28.7	29.2	62.4	0.0	40.7	55.3	0.0	41.8
Incr Delay (d2), s/veh	5.6	0.1	0.0	9.4	15.8	25.0	626.0	0.0	0.0	1599.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	4.6	45.3	53.2	12.0	0.0	0.4	30.8	0.0	1.6
LnGrp Delay(d),s/veh	75.6	0.1	0.0	78.2	44.5	54.1	688.5	0.0	40.7	1655.0	0.0	41.9
LnGrp LOS	E	A	A	E	D	D	F		D	F		D
Approach Vol, veh/h	2008			3262			141			334		
Approach Delay, s/veh	1.7			48.9			624.2			1413.5		
Approach LOS	A			D			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	89.8		45.0	9.0	96.0		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	10.5	79.0		40.0	4.7	90.8		40.0				
Max Q Clear Time (g_c+110), s	110.8	2.0		42.0	5.5	91.2		42.0				
Green Ext Time (p_c), s	0.1	63.4		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	125.9											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative No Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	60	20	20	40	20	450	660	50	60	330	320
Future Volume (veh/h)	300	60	20	20	40	20	450	660	50	60	330	320
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1842	1900	1900	1900	1900	1863	1881	1900	1827	1863	1900
Adj Flow Rate, veh/h	214	245	20	23	45	16	511	750	55	68	375	247
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	4	2	2	0	0	0	2	1	1	4	2	2
Cap, veh/h	318	307	25	30	59	21	542	1804	132	88	568	367
Arrive On Green	0.18	0.18	0.18	0.06	0.06	0.06	0.31	0.54	0.52	0.05	0.28	0.27
Sat Flow, veh/h	1740	1679	137	493	965	343	1774	3364	247	1740	2022	1307
Grp Volume(v), veh/h	214	0	265	84	0	0	511	398	407	68	327	295
Grp Sat Flow(s),veh/h/ln	1740	0	1816	1801	0	0	1774	1787	1823	1740	1770	1559
Q Serve(g_s), s	10.9	0.0	13.3	4.4	0.0	0.0	26.7	12.6	12.7	3.7	15.5	16.0
Cycle Q Clear(g_c), s	10.9	0.0	13.3	4.4	0.0	0.0	26.7	12.6	12.7	3.7	15.5	16.0
Prop In Lane	1.00		0.08	0.27		0.19	1.00		0.14	1.00		0.84
Lane Grp Cap(c), veh/h	318	0	332	111	0	0	542	958	978	88	497	438
V/C Ratio(X)	0.67	0.00	0.80	0.76	0.00	0.00	0.94	0.42	0.42	0.78	0.66	0.67
Avail Cap(c_a), veh/h	587	0	612	417	0	0	598	1196	1220	587	1184	1043
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.1	0.0	37.1	43.8	0.0	0.0	32.1	13.1	13.2	44.5	30.1	30.9
Incr Delay (d2), s/veh	0.9	0.0	1.7	3.9	0.0	0.0	21.6	0.4	0.4	5.4	2.1	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	6.8	2.3	0.0	0.0	16.3	6.3	6.5	1.9	7.8	7.2
LnGrp Delay(d),s/veh	37.0	0.0	38.8	47.7	0.0	0.0	53.7	13.5	13.6	49.9	32.2	33.4
LnGrp LOS	D		D	D			D	B	B	D	C	C
Approach Vol, veh/h		479			84			1316			690	
Approach Delay, s/veh		38.0			47.7			29.2			34.5	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	54.9		21.4	33.0	30.7		9.9				
Change Period (Y+Rc), s	4.0	5.5		4.0	4.0	5.5		4.0				
Max Green Setting (Gmax), s	32.0	62.0		32.0	32.0	62.0		22.0				
Max Q Clear Time (g_c+I1), s	5.7	14.7		15.3	28.7	18.0		6.4				
Green Ext Time (p_c), s	0.1	9.2		1.3	0.4	6.8		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			32.8									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Cumulative No Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	60	30	140	100	10	260	20	830	60	50	320	10
Future Volume (veh/h)	60	30	140	100	10	260	20	830	60	50	320	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1797	1845	1863	1881	1900	1792	1845	1900
Adj Flow Rate, veh/h	69	34	82	115	11	110	23	954	63	57	368	10
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	3	3	3	2	1	1	6	3	3
Cap, veh/h	0	266	220	0	252	189	25	2451	161	67	1828	50
Arrive On Green	0.00	0.14	0.14	0.00	0.14	0.14	0.01	0.50	0.47	0.04	0.52	0.50
Sat Flow, veh/h	0	1900	1567	0	1797	1346	1774	4910	323	1707	3484	95
Grp Volume(v), veh/h	0	34	82	0	11	110	23	665	352	57	185	193
Grp Sat Flow(s),veh/h/ln	0	1900	1567	0	1797	1346	1774	1712	1809	1707	1752	1826
Q Serve(g_s), s	0.0	0.6	1.8	0.0	0.2	2.9	0.5	4.5	4.6	1.2	2.1	2.1
Cycle Q Clear(g_c), s	0.0	0.6	1.8	0.0	0.2	2.9	0.5	4.5	4.6	1.2	2.1	2.1
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.18	1.00		0.05
Lane Grp Cap(c), veh/h	0	266	220	0	252	189	25	1709	903	67	919	958
V/C Ratio(X)	0.00	0.13	0.37	0.00	0.04	0.58	0.91	0.39	0.39	0.85	0.20	0.20
Avail Cap(c_a), veh/h	0	1626	1341	0	2019	1512	1519	3022	1597	1461	1547	1612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	14.1	14.6	0.0	13.9	15.0	18.4	5.8	5.9	17.8	4.7	4.7
Incr Delay (d2), s/veh	0.0	0.1	0.4	0.0	0.0	1.1	32.6	0.2	0.4	10.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.8	0.0	0.1	1.1	0.5	2.2	2.4	0.8	1.0	1.1
LnGrp Delay(d),s/veh	0.0	14.1	15.0	0.0	13.9	16.1	51.0	6.0	6.3	28.1	4.9	4.9
LnGrp LOS		B	B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		116			121			1040			435	
Approach Delay, s/veh		14.7			15.9			7.1			7.9	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.5	22.7	0.0	9.2	4.5	23.6	0.0	9.2				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	13.2	6.6	0.0	3.8	2.5	4.1	0.0	4.9				
Green Ext Time (p_c), s	0.1	10.4	0.0	0.2	0.0	3.5	0.0	0.2				
Intersection Summary												
HCM 2010 Ctrl Delay			8.4									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Cumulative No Project PM

Intersection

Intersection Delay, s/veh32.3

Intersection LOS D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	150	40	60	90	50	170	200	80	90	180	40
Future Vol, veh/h	30	150	40	60	90	50	170	200	80	90	180	40
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	0	0	0	6	3	3	0	0	0
Mvmt Flow	34	169	45	67	101	56	191	225	90	101	202	45
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	16.9	17.8	52.1	23.8
HCM LOS	C	C	F	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	38%	100%	0%	30%	29%
Vol Thru, %	44%	0%	79%	45%	58%
Vol Right, %	18%	0%	21%	25%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	450	30	190	200	310
LT Vol	170	30	0	60	90
Through Vol	200	0	150	90	180
RT Vol	80	0	40	50	40
Lane Flow Rate	506	34	213	225	348
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.943	0.081	0.471	0.481	0.679
Departure Headway (Hd)	6.714	8.622	7.935	7.704	7.014
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	541	415	453	467	516
Service Time	4.77	6.388	5.701	5.776	5.078
HCM Lane V/C Ratio	0.935	0.082	0.47	0.482	0.674
HCM Control Delay	52.1	12.2	17.6	17.8	23.8
HCM Lane LOS	F	B	C	C	C
HCM 95th-tile Q	11.9	0.3	2.5	2.6	5.1

Intersection

Intersection Delay, s/veh 10.6

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	270	40	10	10	20	10	10	10	10	10	10	160
Future Vol, veh/h	270	40	10	10	20	10	10	10	10	10	10	160
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	307	45	11	11	23	11	11	11	11	11	11	182
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	11.9	8.2	8.6	9.1
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	84%	25%	6%
Vol Thru, %	0%	50%	12%	50%	6%
Vol Right, %	0%	50%	3%	25%	89%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	20	320	40	180
LT Vol	10	0	270	10	10
Through Vol	0	10	40	20	10
RT Vol	0	10	10	10	160
Lane Flow Rate	11	23	364	45	205
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.02	0.034	0.474	0.061	0.257
Departure Headway (Hd)	6.221	5.361	4.691	4.796	4.522
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	573	664	764	741	792
Service Time	3.981	3.121	2.737	2.859	2.567
HCM Lane V/C Ratio	0.019	0.035	0.476	0.061	0.259
HCM Control Delay	9.1	8.3	11.9	8.2	9.1
HCM Lane LOS	A	A	B	A	A
HCM 95th-tile Q	0.1	0.1	2.6	0.2	1

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Cumulative No Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	40	230	110	120	180	70	620	70	70	460	50
Future Volume (veh/h)	110	40	230	110	120	180	70	620	70	70	460	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1900	1900	1900	1863	1881	1881	1827	1863	1900
Adj Flow Rate, veh/h	133	48	46	133	145	175	84	747	25	84	554	54
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	1	1	0	0	0	2	1	1	4	2	2
Cap, veh/h	271	279	229	444	190	229	109	1159	494	108	1053	102
Arrive On Green	0.15	0.15	0.15	0.25	0.25	0.25	0.06	0.32	0.32	0.06	0.33	0.31
Sat Flow, veh/h	1774	1828	1497	1810	773	932	1774	3574	1524	1740	3239	315
Grp Volume(v), veh/h	133	47	47	133	0	320	84	747	25	84	302	306
Grp Sat Flow(s),veh/h/ln	1774	1787	1538	1810	0	1705	1774	1787	1524	1740	1770	1784
Q Serve(g_s), s	5.1	1.7	2.0	4.5	0.0	13.0	3.5	13.3	0.8	3.5	10.3	10.4
Cycle Q Clear(g_c), s	5.1	1.7	2.0	4.5	0.0	13.0	3.5	13.3	0.8	3.5	10.3	10.4
Prop In Lane	1.00		0.97	1.00		0.55	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	271	273	235	444	0	419	109	1159	494	108	575	580
V/C Ratio(X)	0.49	0.17	0.20	0.30	0.00	0.76	0.77	0.64	0.05	0.78	0.52	0.53
Avail Cap(c_a), veh/h	620	625	538	633	0	596	525	1587	677	515	785	792
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	27.4	27.5	22.8	0.0	26.1	34.4	21.5	17.3	34.3	20.4	20.5
Incr Delay (d2), s/veh	0.5	0.1	0.2	0.1	0.0	2.0	4.3	0.9	0.1	4.4	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.8	0.9	2.2	0.0	6.3	1.8	6.7	0.4	1.8	5.2	5.3
LnGrp Delay(d),s/veh	29.4	27.5	27.7	23.0	0.0	28.1	38.6	22.3	17.3	38.8	21.5	21.6
LnGrp LOS	C	C	C	C		C	D	C	B	D	C	C
Approach Vol, veh/h	227		453			856			692			
Approach Delay, s/veh	28.6		26.6			23.8			23.6			
Approach LOS	C		C			C			C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	8.6	28.1			15.4	8.6	28.2	22.2				
Change Period (Y+Rc), s	4.0	5.0			4.0	4.0	5.0	4.0				
Max Green Setting (Gmax), s	22.0	32.0			26.0	22.0	32.0	26.0				
Max Q Clear Time (g_c+15), s	15.5	15.3			7.1	5.5	12.4	15.0				
Green Ext Time (p_c), s	0.1	6.5			0.5	0.1	5.3	1.3				
Intersection Summary												
HCM 2010 Ctrl Delay	24.8											
HCM 2010 LOS	C											

HCM 2010 AWSC
6: Coggins Dr & Jones Rd

Cumulative No Project PM

Intersection												
Intersection Delay, s/veh 18.9												
Intersection LOS C												

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	170	300	0	10	40	280	0	10	10	210	20	40
Future Vol, veh/h	170	300	0	10	40	280	0	10	10	210	20	40
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	10	5	5	142	71	71	0	0	0
Mvmt Flow	195	345	0	11	46	322	0	11	11	241	23	46
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	19	16.4	12.2	22.2
HCM LOS	C	C	B	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	63%	0%	100%	0%	0%	78%
Vol Thru, %	50%	37%	100%	0%	100%	5%	7%
Vol Right, %	50%	0%	0%	0%	0%	95%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	270	200	10	27	293	270
LT Vol	0	170	0	10	0	0	210
Through Vol	10	100	200	0	27	13	20
RT Vol	10	0	0	0	0	280	40
Lane Flow Rate	23	310	230	11	31	337	310
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.057	0.63	0.446	0.024	0.059	0.581	0.637
Departure Headway (Hd)	8.868	7.307	6.985	7.49	6.892	6.207	7.395
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	404	493	515	478	520	580	490
Service Time	6.619	5.047	4.724	5.228	4.629	3.945	5.095
HCM Lane V/C Ratio	0.057	0.629	0.447	0.023	0.06	0.581	0.633
HCM Control Delay	12.2	21.7	15.3	10.4	10.1	17.2	22.2
HCM Lane LOS	B	C	C	B	B	C	C
HCM 95th-tile Q	0.2	4.3	2.3	0.1	0.2	3.7	4.4

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative No Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 			  			 				
Traffic Volume (veh/h)	570	1260	0	0	1810	700	100	250	600	0	0	0
Future Volume (veh/h)	570	1260	0	0	1810	700	100	250	600	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	588	1299	0	0	1866	0	103	258	548			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	574	2644	0	0	2806	874	353	374	627			
Arrive On Green	0.17	0.74	0.00	0.00	0.55	0.00	0.20	0.20	0.20			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3155			
Grp Volume(v), veh/h	588	1299	0	0	1866	0	103	258	548			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1577			
Q Serve(g_s), s	25.0	22.3	0.0	0.0	38.8	0.0	7.4	19.1	25.3			
Cycle Q Clear(g_c), s	25.0	22.3	0.0	0.0	38.8	0.0	7.4	19.1	25.3			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	574	2644	0	0	2806	874	353	374	627			
V/C Ratio(X)	1.03	0.49	0.00	0.00	0.66	0.00	0.29	0.69	0.87			
Avail Cap(c_a), veh/h	574	2644	0	0	2806	874	412	436	732			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.17	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	62.5	8.0	0.0	0.0	24.2	0.0	51.1	55.8	58.3			
Incr Delay (d2), s/veh	44.1	0.7	0.0	0.0	0.2	0.0	0.2	2.6	9.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	15.4	11.1	0.0	0.0	18.4	0.0	3.7	10.2	11.8			
LnGrp Delay(d),s/veh	106.6	8.6	0.0	0.0	24.4	0.0	51.3	58.4	67.4			
LnGrp LOS	F	A			C		D	E	E			
Approach Vol, veh/h	1887				1866				909			
Approach Delay, s/veh	39.2				24.4				63.0			
Approach LOS	D				C				E			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2				5		8					
Phs Duration (G+Y+Rc), s	116.0				29.0		87.0		34.0			
Change Period (Y+Rc), s	5.0				4.0		5.0		4.2			
Max Green Setting (Gmax), s	106.0				25.0		77.0		34.8			
Max Q Clear Time (g_c+I1), s	24.3				27.0		40.8		27.3			
Green Ext Time (p_c), s	43.0				0.0		32.2		1.7			
Intersection Summary												
HCM 2010 Ctrl Delay			37.9									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Cumulative No Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 			 	
Traffic Volume (veh/h)	160	1520	180	160	1560	100	360	490	310	260	290	590
Future Volume (veh/h)	160	1520	180	160	1560	100	360	490	310	260	290	590
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		0.91	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	163	1551	173	163	1592	0	367	500	109	265	296	496
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	180	1501	167	180	1652	424	389	1119	455	262	1243	505
Arrive On Green	0.05	0.32	0.32	0.05	0.32	0.00	0.11	0.31	0.31	0.15	0.35	0.35
Sat Flow, veh/h	3442	4666	520	3442	5136	1319	3442	3574	1455	1774	3574	1451
Grp Volume(v), veh/h	163	1137	587	163	1592	0	367	500	109	265	296	496
Grp Sat Flow(s),veh/h/ln	1721	1712	1762	1721	1712	1319	1721	1787	1455	1774	1787	1451
Q Serve(g_s), s	5.4	37.0	37.0	5.4	35.0	0.0	12.2	12.8	6.4	17.0	6.8	39.0
Cycle Q Clear(g_c), s	5.4	37.0	37.0	5.4	35.0	0.0	12.2	12.8	6.4	17.0	6.8	39.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	1102	567	180	1652	424	389	1119	455	262	1243	505
V/C Ratio(X)	0.91	1.03	1.03	0.91	0.96	0.00	0.94	0.45	0.24	1.01	0.24	0.98
Avail Cap(c_a), veh/h	180	1102	567	180	1652	424	389	1119	455	262	1243	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.50	0.50	0.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	54.2	39.0	39.0	54.2	38.3	0.0	50.6	31.5	29.3	49.0	26.7	37.2
Incr Delay (d2), s/veh	36.2	33.1	43.2	25.5	9.2	0.0	31.1	0.1	0.1	53.1	0.0	31.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	22.5	24.8	3.2	17.9	0.0	7.5	6.3	2.6	12.2	3.3	20.0
LnGrp Delay(d),s/veh	90.5	72.1	82.2	79.7	47.6	0.0	81.7	31.7	29.4	102.2	26.7	69.0
LnGrp LOS	F	F	F	E	D		F	C	C	F	C	E
Approach Vol, veh/h	1887		1755				976			1057		
Approach Delay, s/veh	76.8		50.6				50.2			65.4		
Approach LOS	E		D				D			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.0	43.0	17.0	45.0	10.0	43.0	21.0	41.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	40.0	37.0	13.0	40.0	6.0	37.0	17.0	36.0				
Max Q Clear Time (g_c+I17), s	40.0	39.0	14.2	41.0	7.4	37.0	19.0	14.8				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3				
Intersection Summary												
HCM 2010 Ctrl Delay			62.0									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Cumulative No Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  					 	 	
Traffic Volume (veh/h)	90	1920	70	150	1600	360	120	40	500	410	50	110
Future Volume (veh/h)	90	1920	70	150	1600	360	120	40	500	410	50	110
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.95	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1867	1881
Adj Flow Rate, veh/h	95	2021	71	158	1684	0	126	42	340	470	0	39
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	137	1815	64	106	1936	603	449	43	352	697	0	292
Arrive On Green	0.04	0.36	0.36	0.06	0.38	0.00	0.25	0.25	0.25	0.20	0.00	0.20
Sat Flow, veh/h	3442	5085	178	1774	5136	1599	1774	171	1388	3548	0	1487
Grp Volume(v), veh/h	95	1359	733	158	1684	0	126	0	382	470	0	39
Grp Sat Flow(s),veh/h/ln	1721	1712	1840	1774	1712	1599	1774	0	1559	1774	0	1487
Q Serve(g_s), s	4.1	53.5	53.5	9.0	45.6	0.0	8.6	0.0	36.3	18.4	0.0	3.2
Cycle Q Clear(g_c), s	4.1	53.5	53.5	9.0	45.6	0.0	8.6	0.0	36.3	18.4	0.0	3.2
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.89	1.00		1.00
Lane Grp Cap(c), veh/h	137	1222	657	106	1936	603	449	0	395	697	0	292
V/C Ratio(X)	0.69	1.11	1.12	1.48	0.87	0.00	0.28	0.00	0.97	0.67	0.00	0.13
Avail Cap(c_a), veh/h	138	1222	657	106	1936	603	449	0	395	852	0	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.11	0.11	0.11	0.69	0.69	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	71.1	48.2	48.2	70.5	43.3	0.0	45.0	0.0	55.4	55.8	0.0	49.7
Incr Delay (d2), s/veh	1.4	52.0	55.3	249.4	4.0	0.0	0.1	0.0	36.4	0.9	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	34.1	37.3	11.8	22.2	0.0	4.2	0.0	19.7	9.1	0.0	1.3
LnGrp Delay(d),s/veh	72.5	100.3	103.5	319.9	47.3	0.0	45.1	0.0	91.7	56.8	0.0	49.8
LnGrp LOS	E	F	F	F	D		D		F	E		D
Approach Vol, veh/h	2187				1842		508				509	
Approach Delay, s/veh	100.1				70.7		80.2				56.2	
Approach LOS	F				E		F				E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	3.0	59.5			34.5	10.0	62.6	43.0				
Change Period (Y+Rc), s	4.0	6.0			5.0	4.0	6.0	5.0				
Max Green Setting (Gmax), s	47.0	47.0			36.0	6.0	50.0	38.0				
Max Q Clear Time (g_c+111), s	55.5	55.5			20.4	6.1	47.6	38.3				
Green Ext Time (p_c), s	0.0	0.0			1.0	0.0	2.3	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			83.0									
HCM 2010 LOS			F									
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Cumulative No Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑	↱		↰	↱		↰	↱
Traffic Volume (veh/h)	100	2750	80	80	1780	40	210	60	410	50	20	40
Future Volume (veh/h)	100	2750	80	80	1780	40	210	60	410	50	20	40
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	104	2865	64	83	1854	40	219	62	368	52	21	10
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	0	0	0	0	0	0
Cap, veh/h	127	2726	815	89	2630	57	49	0	495	47	12	440
Arrive On Green	0.07	0.53	0.53	0.05	0.51	0.51	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1774	5136	1536	1774	5169	111	0	0	1607	0	38	1430
Grp Volume(v), veh/h	104	2865	64	83	1228	666	281	0	368	73	0	10
Grp Sat Flow(s),veh/h/ln	1774	1712	1536	1774	1712	1857	0	0	1607	38	0	1430
Q Serve(g_s), s	7.5	69.0	2.7	6.1	35.7	35.7	0.0	0.0	26.7	0.0	0.0	0.6
Cycle Q Clear(g_c), s	7.5	69.0	2.7	6.1	35.7	35.7	40.0	0.0	26.7	40.0	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.06	0.78		1.00	0.71		1.00
Lane Grp Cap(c), veh/h	127	2726	815	89	1742	945	49	0	495	59	0	440
V/C Ratio(X)	0.82	1.05	0.08	0.94	0.70	0.71	5.70	0.00	0.74	1.23	0.00	0.02
Avail Cap(c_a), veh/h	207	2726	815	89	1742	945	49	0	495	59	0	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	59.5	30.5	14.9	61.5	24.4	24.5	65.0	0.0	40.4	57.1	0.0	31.4
Incr Delay (d2), s/veh	0.5	24.1	0.0	73.5	2.4	4.4	2159.6	0.0	5.4	192.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	38.4	1.1	4.8	17.5	19.5	31.3	0.0	12.6	5.3	0.0	0.3
LnGrp Delay(d),s/veh	59.9	54.6	15.0	135.1	26.9	28.9	2224.6	0.0	45.8	249.4	0.0	31.4
LnGrp LOS	E	F	B	F	C	C	F		D	F		C
Approach Vol, veh/h	3033			1977			649			83		
Approach Delay, s/veh	54.0			32.1			989.2			223.2		
Approach LOS	D			C			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.0	74.0		45.0	13.8	71.2		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	69.0	5		40.0	15.2	60.3		40.0				
Max Q Clear Time (g_c+I), s	71.0	19		42.0	9.5	37.7		42.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.1	20.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	154.6											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	20	52	50	30	30	242	237	20	60	1212	340
Future Volume (veh/h)	150	20	52	50	30	30	242	237	20	60	1212	340
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.95	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1827	1850	1900	1900	1846	1900	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	114	99	37	56	34	26	272	266	20	67	1362	369
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	184	135	50	61	37	28	290	2185	163	85	1488	391
Arrive On Green	0.11	0.11	0.11	0.07	0.07	0.07	0.17	0.66	0.65	0.05	0.54	0.53
Sat Flow, veh/h	1740	1277	477	838	509	389	1740	3325	248	1740	2759	724
Grp Volume(v), veh/h	114	0	136	116	0	0	272	141	145	67	858	873
Grp Sat Flow(s),veh/h/ln	1740	0	1755	1736	0	0	1740	1770	1803	1740	1770	1713
Q Serve(g_s), s	8.7	0.0	10.4	9.2	0.0	0.0	21.3	4.1	4.2	5.3	59.8	66.2
Cycle Q Clear(g_c), s	8.7	0.0	10.4	9.2	0.0	0.0	21.3	4.1	4.2	5.3	59.8	66.2
Prop In Lane	1.00		0.27	0.48		0.22	1.00		0.14	1.00		0.42
Lane Grp Cap(c), veh/h	184	0	186	126	0	0	290	1163	1185	85	955	924
V/C Ratio(X)	0.62	0.00	0.73	0.92	0.00	0.00	0.94	0.12	0.12	0.79	0.90	0.94
Avail Cap(c_a), veh/h	328	0	330	126	0	0	290	1163	1185	151	961	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.1	0.0	59.9	63.7	0.0	0.0	56.9	8.8	8.9	65.0	28.4	30.2
Incr Delay (d2), s/veh	1.3	0.0	2.1	56.2	0.0	0.0	36.4	0.1	0.1	6.0	11.4	17.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	5.1	6.4	0.0	0.0	13.2	2.0	2.1	2.7	32.1	35.6
LnGrp Delay(d),s/veh	60.4	0.0	62.0	119.8	0.0	0.0	93.2	8.9	8.9	71.0	39.8	47.9
LnGrp LOS	E		E	F			F	A	A	E	D	D
Approach Vol, veh/h	250			116			558			1798		
Approach Delay, s/veh	61.2			119.8			50.0			44.9		
Approach LOS	E			F			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			4	5	6	8				
Phs Duration (G+Y+Rc), s	10.7	94.8			18.6	27.0	78.5	14.0				
Change Period (Y+Rc), s	4.0	5.5			4.0	4.0	5.5	4.0				
Max Green Setting (Gmax), s	12.0	84.5			26.0	23.0	73.5	10.0				
Max Q Clear Time (g_c+I1), s	7.3	6.2			12.4	23.3	68.2	11.2				
Green Ext Time (p_c), s	0.0	2.7			0.6	0.0	4.8	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				50.7								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Cumulative Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↰↱↲		↰	↰↱	
Traffic Volume (veh/h)	10	0	10	204	30	199	30	310	53	124	1090	110
Future Volume (veh/h)	10	0	10	204	30	199	30	310	53	124	1090	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.96	1.00		0.95	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1827	1863	1900	1831	1863	1827	1863	1900	1827	1863	1900
Adj Flow Rate, veh/h	11	0	6	224	33	89	33	341	44	136	1198	117
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	4	2	2	4	2	2
Cap, veh/h	0	261	219	0	261	192	38	2252	282	177	1869	182
Arrive On Green	0.00	0.00	0.14	0.00	0.14	0.14	0.02	0.50	0.47	0.10	0.58	0.55
Sat Flow, veh/h	0	1827	1533	0	1831	1345	1740	4548	570	1740	3249	317
Grp Volume(v), veh/h	0	0	6	0	33	89	33	252	133	136	651	664
Grp Sat Flow(s),veh/h/ln	0	1827	1533	0	1831	1345	1740	1695	1728	1740	1770	1796
Q Serve(g_s), s	0.0	0.0	0.2	0.0	0.7	2.8	0.9	1.9	2.0	3.5	11.4	11.5
Cycle Q Clear(g_c), s	0.0	0.0	0.2	0.0	0.7	2.8	0.9	1.9	2.0	3.5	11.4	11.5
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.33	1.00		0.18
Lane Grp Cap(c), veh/h	0	261	219	0	261	192	38	1679	856	177	1018	1033
V/C Ratio(X)	0.00	0.00	0.03	0.00	0.13	0.46	0.87	0.15	0.16	0.77	0.64	0.64
Avail Cap(c_a), veh/h	0	1268	1064	0	1668	1225	1208	2426	1237	1208	1267	1285
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	17.0	0.0	17.3	18.1	22.5	6.3	6.5	20.2	6.6	6.7
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.1	0.6	19.7	0.1	0.1	2.6	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.1	0.0	0.4	1.1	0.6	0.9	1.0	1.8	5.7	5.8
LnGrp Delay(d),s/veh	0.0	0.0	17.0	0.0	17.3	18.8	42.2	6.4	6.6	22.8	7.6	7.7
LnGrp LOS			B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		6			122			418			1451	
Approach Delay, s/veh		17.0			18.4			9.3			9.1	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	26.8	0.0	10.6	5.0	30.5	0.0	10.6				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I), s	15.5	4.0	0.0	2.2	2.9	13.5	0.0	4.8				
Green Ext Time (p_c), s	0.2	3.6	0.0	0.0	0.0	12.0	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			9.7									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Cumulative Plus Project AM

Intersection

Intersection Delay, s/veh 78.2

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	68	50	165	263	57	120	90	70	81	290	70
Future Vol, veh/h	20	68	50	165	263	57	120	90	70	81	290	70
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	23	77	57	188	299	65	136	102	80	92	330	80
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	16.2	121.5	29.7	80.7
HCM LOS	C	F	D	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	43%	100%	0%	34%	18%
Vol Thru, %	32%	0%	58%	54%	66%
Vol Right, %	25%	0%	42%	12%	16%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	280	20	118	485	441
LT Vol	120	20	0	165	81
Through Vol	90	0	68	263	290
RT Vol	70	0	50	57	70
Lane Flow Rate	318	23	134	551	501
Geometry Grp	2	7	7	5	2
Degree of Util (X)	0.704	0.061	0.328	1.163	1.036
Departure Headway (Hd)	8.631	10.305	9.419	7.88	7.995
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	423	350	385	463	456
Service Time	6.631	8.005	7.119	5.88	5.995
HCM Lane V/C Ratio	0.752	0.066	0.348	1.19	1.099
HCM Control Delay	29.7	13.7	16.6	121.5	80.7
HCM Lane LOS	D	B	C	F	F
HCM 95th-tile Q	5.3	0.2	1.4	19.5	14.3

Intersection

Intersection Delay, s/veh 11.8

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	160	30	39	0	30	10	86	26	10	10	15	360
Future Vol, veh/h	160	30	39	0	30	10	86	26	10	10	15	360
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	2	1	1	2	1	1	2	1	1	2	1	1
Mvmt Flow	176	33	43	0	33	11	95	29	11	11	16	396
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	11.7	9	9.8	12.7
HCM LOS	B	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	70%	0%	3%
Vol Thru, %	0%	72%	13%	75%	4%
Vol Right, %	0%	28%	17%	25%	94%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	86	36	229	40	385
LT Vol	86	0	160	0	10
Through Vol	0	26	30	30	15
RT Vol	0	10	39	10	360
Lane Flow Rate	95	40	252	44	423
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.166	0.062	0.379	0.068	0.536
Departure Headway (Hd)	6.341	5.62	5.415	5.596	4.565
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	566	638	664	640	795
Service Time	4.072	3.351	3.443	3.636	2.565
HCM Lane V/C Ratio	0.168	0.063	0.38	0.069	0.532
HCM Control Delay	10.3	8.7	11.7	9	12.7
HCM Lane LOS	B	A	B	A	B
HCM 95th-tile Q	0.6	0.2	1.8	0.2	3.2

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Cumulative Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	51	50	100	60	50	80	263	50	140	924	230
Future Volume (veh/h)	70	51	50	100	60	50	80	263	50	140	924	230
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		0.94	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1900	1863	1881	1881	1863	1881	1900
Adj Flow Rate, veh/h	76	55	9	109	65	29	87	286	18	152	1004	235
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	277	477	75	295	200	89	113	1305	550	190	1169	273
Arrive On Green	0.16	0.16	0.16	0.17	0.17	0.17	0.06	0.37	0.37	0.11	0.41	0.40
Sat Flow, veh/h	1774	3056	482	1774	1199	535	1774	3574	1506	1774	2858	667
Grp Volume(v), veh/h	76	31	33	109	0	94	87	286	18	152	626	613
Grp Sat Flow(s),veh/h/ln	1774	1787	1751	1774	0	1734	1774	1787	1506	1774	1787	1738
Q Serve(g_s), s	2.9	1.2	1.3	4.3	0.0	3.7	3.8	4.3	0.6	6.5	24.9	25.2
Cycle Q Clear(g_c), s	2.9	1.2	1.3	4.3	0.0	3.7	3.8	4.3	0.6	6.5	24.9	25.2
Prop In Lane	1.00		0.28	1.00		0.31	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	277	279	274	295	0	289	113	1305	550	190	731	711
V/C Ratio(X)	0.27	0.11	0.12	0.37	0.00	0.33	0.77	0.22	0.03	0.80	0.86	0.86
Avail Cap(c_a), veh/h	591	595	583	591	0	577	500	1510	636	500	755	734
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	28.3	28.3	28.9	0.0	28.7	36.0	17.1	15.9	34.0	21.0	21.3
Incr Delay (d2), s/veh	0.2	0.1	0.1	0.3	0.0	0.2	4.1	0.1	0.0	2.9	9.8	10.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.6	0.6	2.1	0.0	1.8	2.0	2.1	0.3	3.4	14.2	14.0
LnGrp Delay(d),s/veh	29.2	28.4	28.4	29.2	0.0	28.9	40.2	17.2	16.0	37.0	30.8	31.7
LnGrp LOS	C	C	C	C		C	D	B	B	D	C	C
Approach Vol, veh/h		140			203			391			1391	
Approach Delay, s/veh		28.9			29.1			22.3			31.9	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.4	32.5		16.2	9.0	35.9		17.0				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.0	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+1.5), s	19.5	6.3		4.9	5.8	27.2		6.3				
Green Ext Time (p_c), s	0.2	2.7		0.3	0.1	3.8		0.5				
Intersection Summary												
HCM 2010 Ctrl Delay				29.6								
HCM 2010 LOS				C								

Intersection

Intersection Delay, s/veh42.6

Intersection LOS E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	40	50	10	10	180	210	0	10	10	365	10	160
Future Vol, veh/h	40	50	10	10	180	210	0	10	10	365	10	160
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	6	3	3	6	3	3	6	3	3	6	3	3
Mvmt Flow	43	54	11	11	196	228	0	11	11	397	11	174
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach RightNB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	12.2	14.4	10.1	70.6
HCM LOS	B	B	B	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	62%	0%	100%	0%	0%	68%
Vol Thru, %	50%	38%	71%	0%	100%	22%	2%
Vol Right, %	50%	0%	29%	0%	0%	78%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	65	35	10	120	270	535
LT Vol	0	40	0	10	0	0	365
Through Vol	10	25	25	0	120	60	10
RT Vol	10	0	10	0	0	210	160
Lane Flow Rate	22	71	38	11	130	293	582
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.042	0.159	0.08	0.022	0.249	0.515	1.029
Departure Headway (Hd)	7.046	8.415	7.834	7.52	6.872	6.314	6.372
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	511	429	460	479	519	566	570
Service Time	4.746	6.115	5.534	5.22	4.655	4.096	4.122
HCM Lane V/C Ratio	0.043	0.166	0.083	0.023	0.25	0.518	1.021
HCM Control Delay	10.1	12.7	11.2	10.4	11.9	15.7	70.6
HCM Lane LOS	B	B	B	B	B	C	F
HCM 95th-tile Q	0.1	0.6	0.3	0.1	1	2.9	15.8

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↷			↷	↷	↰	↷	↷			
Traffic Volume (veh/h)	420	1075	0	0	1833	640	180	621	1153	0	0	0
Future Volume (veh/h)	420	1075	0	0	1833	640	180	621	1153	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	438	1120	0	0	1909	0	188	647	1097			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	344	1888	0	0	1970	613	656	695	1179			
Arrive On Green	0.10	0.53	0.00	0.00	0.38	0.00	0.37	0.37	0.37			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3190			
Grp Volume(v), veh/h	438	1120	0	0	1909	0	188	647	1097			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1595			
Q Serve(g_s), s	9.0	19.4	0.0	0.0	32.8	0.0	6.7	29.7	29.7			
Cycle Q Clear(g_c), s	9.0	19.4	0.0	0.0	32.8	0.0	6.7	29.7	29.7			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	344	1888	0	0	1970	613	656	695	1179			
V/C Ratio(X)	1.27	0.59	0.00	0.00	0.97	0.00	0.29	0.93	0.93			
Avail Cap(c_a), veh/h	344	1888	0	0	1970	613	670	711	1205			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.39	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	40.5	14.6	0.0	0.0	27.2	0.0	20.0	27.3	27.2			
Incr Delay (d2), s/veh	143.6	1.4	0.0	0.0	7.3	0.0	0.1	18.2	12.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.1	9.9	0.0	0.0	16.7	0.0	3.3	19.0	15.1			
LnGrp Delay(d),s/veh	184.1	16.0	0.0	0.0	34.5	0.0	20.1	45.5	39.5			
LnGrp LOS	F	B			C		C	D	D			
Approach Vol, veh/h		1558			1909			1932				
Approach Delay, s/veh		63.2			34.5			39.6				
Approach LOS		E			C			D				
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		52.5			13.0	39.5		37.5				
Change Period (Y+Rc), s		5.0			4.0	5.0		4.2				
Max Green Setting (Gmax), s		46.8			9.0	33.8		34.0				
Max Q Clear Time (g_c+I1), s		21.4			11.0	34.8		31.7				
Green Ext Time (p_c), s		17.4			0.0	0.0		1.5				
Intersection Summary												
HCM 2010 Ctrl Delay			44.6									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Cumulative Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 			 	
Traffic Volume (veh/h)	232	1666	330	450	1971	150	260	251	50	110	642	262
Future Volume (veh/h)	232	1666	330	450	1971	150	260	251	50	110	642	262
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.84	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	239	1718	317	464	2032	0	268	259	14	113	662	162
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	283	1752	320	451	2319	596	261	926	349	135	927	404
Arrive On Green	0.08	0.40	0.40	0.13	0.45	0.00	0.08	0.26	0.26	0.08	0.26	0.26
Sat Flow, veh/h	3442	4349	794	3442	5136	1319	3442	3574	1345	1774	3574	1556
Grp Volume(v), veh/h	239	1349	686	464	2032	0	268	259	14	113	662	162
Grp Sat Flow(s),veh/h/ln	1721	1712	1720	1721	1712	1319	1721	1787	1345	1774	1787	1556
Q Serve(g_s), s	9.9	56.3	57.5	19.0	52.1	0.0	11.0	8.4	1.1	9.1	24.4	12.5
Cycle Q Clear(g_c), s	9.9	56.3	57.5	19.0	52.1	0.0	11.0	8.4	1.1	9.1	24.4	12.5
Prop In Lane	1.00		0.46	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	1379	693	451	2319	596	261	926	349	135	927	404
V/C Ratio(X)	0.84	0.98	0.99	1.03	0.88	0.00	1.03	0.28	0.04	0.84	0.71	0.40
Avail Cap(c_a), veh/h	285	1379	693	451	2319	596	261	926	349	159	937	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.58	0.58	0.58	0.09	0.09	0.00	1.00	1.00	1.00	0.20	0.20	0.20
Uniform Delay (d), s/veh	65.6	42.7	43.0	63.0	36.1	0.0	67.0	42.9	40.2	66.1	48.8	44.4
Incr Delay (d2), s/veh	12.6	13.9	24.0	20.9	0.5	0.0	62.7	0.1	0.0	6.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	29.3	31.9	10.3	24.8	0.0	7.5	4.1	0.4	4.7	12.1	5.4
LnGrp Delay(d),s/veh	78.2	56.6	67.0	83.9	36.6	0.0	129.8	43.0	40.2	72.2	49.3	44.4
LnGrp LOS	E	E	E	F	D		F	D	D	E	D	D
Approach Vol, veh/h	2274						2496		541		937	
Approach Delay, s/veh	62.0						45.4		85.9		51.2	
Approach LOS	E						D		F		D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.0	64.4	15.0	42.6	15.9	71.5	15.0	42.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	19.0	58.0	11.0	38.0	12.0	65.0	13.0	36.0				
Max Q Clear Time (g_c+21), s	21.0	59.5	13.0	26.4	11.9	54.1	11.1	10.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.0	10.6	0.0	1.1				
Intersection Summary												
HCM 2010 Ctrl Delay			55.8									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Cumulative Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  					 	 	
Traffic Volume (veh/h)	86	1560	170	260	2320	454	40	31	170	292	82	101
Future Volume (veh/h)	86	1560	170	260	2320	454	40	31	170	292	82	101
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		0.93	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1871	1881
Adj Flow Rate, veh/h	90	1625	166	271	2417	0	42	32	37	194	238	44
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	134	1803	184	248	2483	773	248	107	124	363	383	299
Arrive On Green	0.04	0.38	0.38	0.28	0.97	0.00	0.14	0.14	0.14	0.20	0.20	0.20
Sat Flow, veh/h	3442	4714	481	1774	5136	1599	1774	766	885	1774	1871	1463
Grp Volume(v), veh/h	90	1179	612	271	2417	0	42	0	69	194	238	44
Grp Sat Flow(s),veh/h/ln	1721	1712	1771	1774	1712	1599	1774	0	1651	1774	1871	1463
Q Serve(g_s), s	3.9	48.7	48.9	21.0	39.9	0.0	3.1	0.0	5.6	14.7	17.4	3.7
Cycle Q Clear(g_c), s	3.9	48.7	48.9	21.0	39.9	0.0	3.1	0.0	5.6	14.7	17.4	3.7
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	134	1309	677	248	2483	773	248	0	231	363	383	299
V/C Ratio(X)	0.67	0.90	0.90	1.09	0.97	0.00	0.17	0.00	0.30	0.53	0.62	0.15
Avail Cap(c_a), veh/h	138	1309	677	248	2483	773	414	0	385	426	449	351
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.11	0.11	0.11	0.28	0.28	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.1	43.6	43.7	54.0	1.9	0.0	56.9	0.0	57.9	53.3	54.4	48.9
Incr Delay (d2), s/veh	1.0	1.3	2.5	58.2	5.2	0.0	0.1	0.0	0.3	0.5	1.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	23.2	24.4	14.2	12.8	0.0	1.5	0.0	2.6	7.2	9.1	1.5
LnGrp Delay(d),s/veh	72.2	44.9	46.2	112.2	7.2	0.0	57.0	0.0	58.2	53.7	55.4	49.0
LnGrp LOS	E	D	D	F	A		E		E	D	E	D
Approach Vol, veh/h	1881			2688			111			476		
Approach Delay, s/veh	46.6			17.8			57.7			54.1		
Approach LOS	D			B			E			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.0	63.4		35.7	9.9	78.5		26.0				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	21.0	38.0		36.0	6.0	53.0		35.0				
Max Q Clear Time (g_c+23.0), s	23.0	50.9		19.4	5.9	41.9		7.6				
Green Ext Time (p_c), s	0.0	0.0		1.2	0.0	11.0		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay	32.5											
HCM 2010 LOS	C											
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Cumulative Plus Project AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑	↱		↰	↱		↰	↱
Traffic Volume (veh/h)	40	1792	130	100	2954	51	70	51	60	84	194	80
Future Volume (veh/h)	40	1792	130	100	2954	51	70	51	60	84	194	80
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.95	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1870	1881	1900	1876	1881
Adj Flow Rate, veh/h	42	1886	92	105	3109	53	74	54	14	88	204	50
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	1	1	1	1	1	1
Cap, veh/h	54	2904	875	126	3151	53	38	18	421	31	28	375
Arrive On Green	0.06	1.00	1.00	0.07	0.61	0.61	0.27	0.27	0.27	0.27	0.27	0.27
Sat Flow, veh/h	1774	5136	1548	1774	5196	88	0	68	1579	0	106	1406
Grp Volume(v), veh/h	42	1886	92	105	2041	1121	128	0	14	292	0	50
Grp Sat Flow(s), veh/h/ln	1774	1712	1548	1774	1712	1861	68	0	1579	106	0	1406
Q Serve(g_s), s	3.5	0.0	0.0	8.8	87.1	89.6	0.0	0.0	1.0	0.0	0.0	4.1
Cycle Q Clear(g_c), s	3.5	0.0	0.0	8.8	87.1	89.6	40.0	0.0	1.0	40.0	0.0	4.1
Prop In Lane	1.00		1.00	1.00		0.05	0.58		1.00	0.30		1.00
Lane Grp Cap(c), veh/h	54	2904	875	126	2076	1128	56	0	421	60	0	375
V/C Ratio(X)	0.78	0.65	0.11	0.83	0.98	0.99	2.28	0.00	0.03	4.91	0.00	0.13
Avail Cap(c_a), veh/h	56	2904	875	195	2076	1128	56	0	421	60	0	375
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	70.0	0.0	0.0	68.8	28.8	29.2	62.3	0.0	40.7	56.5	0.0	41.8
Incr Delay (d2), s/veh	5.6	0.1	0.0	9.4	16.1	25.4	629.6	0.0	0.0	1794.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	0.0	4.6	45.5	53.7	12.1	0.0	0.4	32.1	0.0	1.6
LnGrp Delay(d),s/veh	75.6	0.1	0.0	78.2	44.9	54.6	691.8	0.0	40.7	1851.2	0.0	41.9
LnGrp LOS	E	A	A	E	D	D	F		D	F		D
Approach Vol, veh/h	2020			3267			142			342		
Approach Delay, s/veh	1.7			49.3			627.6			1586.7		
Approach LOS	A			D			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	89.8		45.0	9.0	96.0		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	10.5	79.0		40.0	4.7	90.8		40.0				
Max Q Clear Time (g_c+110, s)	110.8	2.0		42.0	5.5	91.6		42.0				
Green Ext Time (p_c), s	0.1	63.7		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	138.0											
HCM 2010 LOS	F											

HCM 2010 Signalized Intersection Summary

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative Plus Project PM

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	300	60	26	20	40	20	458	665	50	60	339	320						
Future Volume (veh/h)	300	60	26	20	40	20	458	665	50	60	339	320						
Number	7	4	14	3	8	18	5	2	12	1	6	16						
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0						
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.97	1.00		0.95	1.00		0.95						
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Adj Sat Flow, veh/h/ln	1827	1843	1900	1900	1900	1900	1863	1881	1900	1827	1863	1900						
Adj Flow Rate, veh/h	218	240	27	23	45	16	520	756	55	68	385	247						
Adj No. of Lanes	1	1	0	0	1	0	1	2	0	1	2	0						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88						
Percent Heavy Veh, %	4	2	2	0	0	0	2	1	1	4	2	2						
Cap, veh/h	320	299	34	30	59	21	549	1816	132	88	573	361						
Arrive On Green	0.18	0.18	0.18	0.06	0.06	0.06	0.31	0.54	0.52	0.05	0.28	0.26						
Sat Flow, veh/h	1740	1625	183	493	965	343	1774	3366	245	1740	2044	1289						
Grp Volume(v), veh/h	218	0	267	84	0	0	520	401	410	68	332	300						
Grp Sat Flow(s),veh/h/ln	1740	0	1808	1801	0	0	1774	1787	1824	1740	1770	1563						
Q Serve(g_s), s	11.4	0.0	13.7	4.5	0.0	0.0	27.8	12.9	13.0	3.8	16.2	16.7						
Cycle Q Clear(g_c), s	11.4	0.0	13.7	4.5	0.0	0.0	27.8	12.9	13.0	3.8	16.2	16.7						
Prop In Lane	1.00		0.10	0.27		0.19	1.00		0.13	1.00		0.82						
Lane Grp Cap(c), veh/h	320	0	332	111	0	0	549	964	984	88	496	438						
V/C Ratio(X)	0.68	0.00	0.80	0.76	0.00	0.00	0.95	0.42	0.42	0.78	0.67	0.68						
Avail Cap(c_a), veh/h	573	0	596	408	0	0	584	1168	1192	573	1157	1022						
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00						
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00						
Uniform Delay (d), s/veh	37.0	0.0	38.0	44.9	0.0	0.0	32.7	13.3	13.3	45.6	31.0	31.7						
Incr Delay (d2), s/veh	1.0	0.0	1.7	3.9	0.0	0.0	23.5	0.4	0.4	5.4	2.2	2.7						
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						
%ile BackOfQ(50%),veh/ln	5.5	0.0	7.0	2.3	0.0	0.0	17.2	6.5	6.6	1.9	8.2	7.5						
LnGrp Delay(d),s/veh	38.0	0.0	39.7	48.8	0.0	0.0	56.2	13.7	13.7	51.0	33.2	34.4						
LnGrp LOS	D		D	D			E	B	B	D	C	C						
Approach Vol, veh/h	485				84			1331			700							
Approach Delay, s/veh	38.9				48.8			30.3			35.4							
Approach LOS	D				D			C			D							
Timer	1	2	3	4	5	6	7	8										
Assigned Phs	1	2			4	5	6	8										
Phs Duration (G+Y+Rc), s	8.9	56.4			21.8	34.1	31.2	10.0										
Change Period (Y+Rc), s	4.0	5.5			4.0	4.0	5.5	4.0										
Max Green Setting (Gmax), s	32.0	62.0			32.0	32.0	62.0	22.0										
Max Q Clear Time (g_c+l1), s	5.8	15.0			15.7	29.8	18.7	6.5										
Green Ext Time (p_c), s	0.1	9.3			1.3	0.3	6.9	0.2										
Intersection Summary																		
HCM 2010 Ctrl Delay	33.9																	
HCM 2010 LOS	C																	
Notes																		

HCM 2010 Signalized Intersection Summary

2: Oak Road & Las Juntas Way

Cumulative Plus Project PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔	↔	↔		↔	↔	
Traffic Volume (veh/h)	60	30	140	103	10	273	20	830	68	65	320	10
Future Volume (veh/h)	60	30	140	103	10	273	20	830	68	65	320	10
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.88	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1797	1845	1863	1881	1900	1792	1845	1900
Adj Flow Rate, veh/h	69	34	82	118	11	125	23	954	72	75	368	10
Adj No. of Lanes	0	1	1	0	1	1	1	3	0	1	2	0
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	0	0	0	3	3	3	2	1	1	6	3	3
Cap, veh/h	0	290	240	0	274	206	25	2367	178	92	1836	50
Arrive On Green	0.00	0.15	0.15	0.00	0.15	0.15	0.01	0.49	0.46	0.05	0.53	0.50
Sat Flow, veh/h	0	1900	1571	0	1797	1349	1774	4858	366	1707	3484	95
Grp Volume(v), veh/h	0	34	82	0	11	125	23	672	354	75	185	193
Grp Sat Flow(s),veh/h/ln	0	1900	1571	0	1797	1349	1774	1712	1800	1707	1752	1826
Q Serve(g_s), s	0.0	0.6	1.8	0.0	0.2	3.4	0.5	4.9	5.0	1.7	2.2	2.2
Cycle Q Clear(g_c), s	0.0	0.6	1.8	0.0	0.2	3.4	0.5	4.9	5.0	1.7	2.2	2.2
Prop In Lane	0.00		1.00	0.00		1.00	1.00		0.20	1.00		0.05
Lane Grp Cap(c), veh/h	0	290	240	0	274	206	25	1668	877	92	923	962
V/C Ratio(X)	0.00	0.12	0.34	0.00	0.04	0.61	0.91	0.40	0.40	0.81	0.20	0.20
Avail Cap(c_a), veh/h	0	1551	1282	0	1925	1445	1448	2882	1515	1393	1475	1537
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	14.3	14.8	0.0	14.2	15.5	19.3	6.4	6.5	18.3	4.9	4.9
Incr Delay (d2), s/veh	0.0	0.1	0.3	0.0	0.0	1.1	31.9	0.2	0.4	6.3	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.8	0.0	0.1	1.3	0.5	2.3	2.5	1.0	1.1	1.1
LnGrp Delay(d),s/veh	0.0	14.4	15.2	0.0	14.2	16.6	51.2	6.6	6.9	24.7	5.1	5.1
LnGrp LOS		B	B		B	B	D	A	A	C	A	A
Approach Vol, veh/h		116			136			1049			453	
Approach Delay, s/veh		14.9			16.4			7.7			8.3	
Approach LOS		B			B			A			A	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.1	23.1	0.0	10.0	4.6	24.7	0.0	10.0				
Change Period (Y+Rc), s	4.0	5.0	4.5	4.0	4.0	5.0	4.0	4.0				
Max Green Setting (Gmax), s	32.0	32.0	5.0	32.0	32.0	32.0	32.0	42.0				
Max Q Clear Time (g_c+I1), s	7.0	7.0	0.0	3.8	2.5	4.2	0.0	5.4				
Green Ext Time (p_c), s	0.1	10.5	0.0	0.2	0.0	3.4	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			9.0									
HCM 2010 LOS			A									

HCM 2010 AWSC

3: Coggins Dr & Las Juntas Way

Cumulative Plus Project PM

Intersection

Intersection Delay, s/veh49.5

Intersection LOS E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	177	40	79	106	55	170	200	108	94	180	40
Future Vol, veh/h	30	177	40	79	106	55	170	200	108	94	180	40
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles, %	2	1	1	0	0	0	6	3	3	0	0	0
Mvmt Flow	34	199	45	89	119	62	191	225	121	106	202	45
Number of Lanes	1	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	1	2
HCM Control Delay	20.4	22.9	91.3	29.2
HCM LOS	C	C	F	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	SBLn1
Vol Left, %	36%	100%	0%	33%	30%
Vol Thru, %	42%	0%	82%	44%	57%
Vol Right, %	23%	0%	18%	23%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	478	30	217	240	314
LT Vol	170	30	0	79	94
Through Vol	200	0	177	106	180
RT Vol	108	0	40	55	40
Lane Flow Rate	537	34	244	270	353
Geometry Grp	2	7	7	5	2
Degree of Util (X)	1.083	0.083	0.556	0.595	0.731
Departure Headway (Hd)	7.257	9.272	8.6	8.376	7.801
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	505	389	422	434	466
Service Time	5.257	6.972	6.3	6.376	5.801
HCM Lane V/C Ratio	1.063	0.087	0.578	0.622	0.758
HCM Control Delay	91.3	12.8	21.5	22.9	29.2
HCM Lane LOS	F	B	C	C	D
HCM 95th-tile Q	17	0.3	3.3	3.8	5.9

Intersection

Intersection Delay, s/veh 12.3

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	270	40	69	10	20	10	50	21	10	10	30	160
Future Vol, veh/h	270	40	69	10	20	10	50	21	10	10	30	160
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	2	1	1	0	0	0	0	0	0	0	0	0
Mvmt Flow	307	45	78	11	23	11	57	24	11	11	34	182
Number of Lanes	0	1	0	0	1	0	1	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	2
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	2	1	1
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	2	1	1	1
HCM Control Delay	14.4	8.7	9.6	10.1
HCM LOS	B	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	71%	25%	5%
Vol Thru, %	0%	68%	11%	50%	15%
Vol Right, %	0%	32%	18%	25%	80%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	31	379	40	200
LT Vol	50	0	270	10	10
Through Vol	0	21	40	20	30
RT Vol	0	10	69	10	160
Lane Flow Rate	57	35	431	45	227
Geometry Grp	7	7	2	2	5
Degree of Util (X)	0.104	0.057	0.577	0.067	0.306
Departure Headway (Hd)	6.558	5.821	4.822	5.282	4.85
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	549	619	741	681	732
Service Time	4.262	3.525	2.902	3.288	2.946
HCM Lane V/C Ratio	0.104	0.057	0.582	0.066	0.31
HCM Control Delay	10	8.9	14.4	8.7	10.1
HCM Lane LOS	A	A	B	A	B
HCM 95th-tile Q	0.3	0.2	3.7	0.2	1.3

HCM 2010 Signalized Intersection Summary

5: Oak Road & Wayne Dr

Cumulative Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	43	230	110	120	180	70	628	71	70	463	50
Future Volume (veh/h)	110	43	230	110	120	180	70	628	71	70	463	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1900	1900	1900	1863	1881	1881	1827	1863	1900
Adj Flow Rate, veh/h	133	52	46	133	145	175	84	757	27	84	558	54
Adj No. of Lanes	1	2	0	1	1	0	1	2	1	1	2	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	1	1	0	0	0	2	1	1	4	2	2
Cap, veh/h	271	289	221	444	189	229	109	1164	497	108	1058	102
Arrive On Green	0.15	0.15	0.15	0.25	0.25	0.25	0.06	0.33	0.33	0.06	0.33	0.31
Sat Flow, veh/h	1774	1890	1446	1810	773	932	1774	3574	1524	1740	3241	313
Grp Volume(v), veh/h	133	49	49	133	0	320	84	757	27	84	304	308
Grp Sat Flow(s),veh/h/ln	1774	1787	1549	1810	0	1705	1774	1787	1524	1740	1770	1784
Q Serve(g_s), s	5.1	1.8	2.1	4.5	0.0	13.0	3.5	13.5	0.9	3.6	10.4	10.5
Cycle Q Clear(g_c), s	5.1	1.8	2.1	4.5	0.0	13.0	3.5	13.5	0.9	3.6	10.4	10.5
Prop In Lane	1.00		0.93	1.00		0.55	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	271	273	237	444	0	418	109	1164	497	108	578	583
V/C Ratio(X)	0.49	0.18	0.21	0.30	0.00	0.77	0.77	0.65	0.05	0.78	0.53	0.53
Avail Cap(c_a), veh/h	618	622	539	630	0	594	523	1579	674	513	782	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.0	27.6	27.7	23.0	0.0	26.2	34.5	21.5	17.3	34.5	20.4	20.6
Incr Delay (d2), s/veh	0.5	0.1	0.2	0.1	0.0	2.1	4.3	0.9	0.1	4.4	1.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.9	0.9	2.2	0.0	6.4	1.8	6.8	0.4	1.8	5.2	5.3
LnGrp Delay(d),s/veh	29.5	27.7	27.8	23.1	0.0	28.3	38.8	22.4	17.3	38.9	21.5	21.6
LnGrp LOS	C	C	C	C		C	D	C	B	D	C	C
Approach Vol, veh/h		231			453			868			696	
Approach Delay, s/veh		28.8			26.8			23.8			23.7	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	28.3		15.4	8.6	28.4		22.3				
Change Period (Y+Rc), s	4.0	5.0		4.0	4.0	5.0		4.0				
Max Green Setting (Gmax), s	22.6	32.0		26.0	22.0	32.0		26.0				
Max Q Clear Time (g_c+1.5), s	15.6	15.5		7.1	5.5	12.5		15.0				
Green Ext Time (p_c), s	0.1	6.5		0.5	0.1	5.3		1.3				
Intersection Summary												
HCM 2010 Ctrl Delay			24.9									
HCM 2010 LOS			C									

Intersection

Intersection Delay, s/veh 21.1

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↗	↗↗			↔			↔	
Traffic Vol, veh/h	170	300	0	10	40	308	0	10	10	229	20	40
Future Vol, veh/h	170	300	0	10	40	308	0	10	10	229	20	40
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	10	5	5	142	71	71	0	0	0
Mvmt Flow	195	345	0	11	46	354	0	11	11	263	23	46
Number of Lanes	0	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	2	1	1
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	1	1	2	3
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	1	1	3	2
HCM Control Delay	20.2	19.3	12.4	25.5
HCM LOS	C	C	B	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	0%	63%	0%	100%	0%	0%	79%
Vol Thru, %	50%	37%	100%	0%	100%	4%	7%
Vol Right, %	50%	0%	0%	0%	0%	96%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	20	270	200	10	27	321	289
LT Vol	0	170	0	10	0	0	229
Through Vol	10	100	200	0	27	13	20
RT Vol	10	0	0	0	0	308	40
Lane Flow Rate	23	310	230	11	31	369	332
Geometry Grp	7	8	8	7	7	7	7
Degree of Util (X)	0.058	0.65	0.461	0.024	0.06	0.652	0.692
Departure Headway (Hd)	9.119	7.538	7.215	7.645	7.045	6.356	7.5
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	392	478	499	469	509	569	482
Service Time	6.88	5.282	4.959	5.384	4.784	4.096	5.236
HCM Lane V/C Ratio	0.059	0.649	0.461	0.023	0.061	0.649	0.689
HCM Control Delay	12.4	23.3	16	10.6	10.2	20.3	25.5
HCM Lane LOS	B	C	C	B	B	C	D
HCM 95th-tile Q	0.2	4.6	2.4	0.1	0.2	4.7	5.2

HCM 2010 Signalized Intersection Summary

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	571	1278	0	0	1822	700	100	252	608	0	0	0
Future Volume (veh/h)	571	1278	0	0	1822	700	100	252	608	0	0	0
Number	5	2	12	1	6	16	3	8	18			
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Adj Sat Flow, veh/h/ln	1863	1881	0	0	1881	1881	1863	1881	1881			
Adj Flow Rate, veh/h	589	1318	0	0	1878	0	103	260	556			
Adj No. of Lanes	2	2	0	0	3	1	1	1	2			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	1	0	0	1	1	2	1	1			
Cap, veh/h	574	2637	0	0	2796	871	356	378	634			
Arrive On Green	0.17	0.74	0.00	0.00	0.54	0.00	0.20	0.20	0.20			
Sat Flow, veh/h	3442	3668	0	0	5305	1599	1774	1881	3155			
Grp Volume(v), veh/h	589	1318	0	0	1878	0	103	260	556			
Grp Sat Flow(s),veh/h/ln	1721	1787	0	0	1712	1599	1774	1881	1578			
Q Serve(g_s), s	25.0	23.0	0.0	0.0	39.4	0.0	7.4	19.2	25.6			
Cycle Q Clear(g_c), s	25.0	23.0	0.0	0.0	39.4	0.0	7.4	19.2	25.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	574	2637	0	0	2796	871	356	378	634			
V/C Ratio(X)	1.03	0.50	0.00	0.00	0.67	0.00	0.29	0.69	0.88			
Avail Cap(c_a), veh/h	574	2637	0	0	2796	871	412	436	732			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.16	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh	62.5	8.2	0.0	0.0	24.5	0.0	50.9	55.6	58.1			
Incr Delay (d2), s/veh	44.6	0.7	0.0	0.0	0.2	0.0	0.2	2.6	9.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	15.4	11.4	0.0	0.0	18.7	0.0	3.6	10.2	12.0			
LnGrp Delay(d),s/veh	107.1	8.8	0.0	0.0	24.7	0.0	51.0	58.2	67.8			
LnGrp LOS	F	A			C		D	E	E			
Approach Vol, veh/h	1907				1878				919			
Approach Delay, s/veh	39.2				24.7				63.2			
Approach LOS	D				C				E			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2				5		8					
Phs Duration (G+Y+Rc), s	115.7				29.0		86.7		34.3			
Change Period (Y+Rc), s	5.0				4.0		5.0		4.2			
Max Green Setting (Gmax), s	106.0				25.0		77.0		34.8			
Max Q Clear Time (g_c+I1), s	25.0				27.0		41.4		27.6			
Green Ext Time (p_c), s	43.8				0.0		31.9		1.7			
Intersection Summary												
HCM 2010 Ctrl Delay			38.1									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

8: Oak Road & Treat Blvd

Cumulative Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 			 	
Traffic Volume (veh/h)	167	1538	180	160	1570	100	360	492	310	260	292	592
Future Volume (veh/h)	167	1538	180	160	1570	100	360	492	310	260	292	592
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00	1.00		0.91	1.00		0.91
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	0.82	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1881	1863	1881	1881
Adj Flow Rate, veh/h	170	1569	173	163	1602	0	367	502	109	265	298	498
Adj No. of Lanes	2	3	0	2	3	1	2	2	1	1	2	1
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	180	1503	165	180	1652	424	389	1119	455	262	1243	505
Arrive On Green	0.05	0.32	0.32	0.05	0.32	0.00	0.11	0.31	0.31	0.15	0.35	0.35
Sat Flow, veh/h	3442	4673	514	3442	5136	1319	3442	3574	1455	1774	3574	1451
Grp Volume(v), veh/h	170	1149	593	163	1602	0	367	502	109	265	298	498
Grp Sat Flow(s),veh/h/ln	1721	1712	1763	1721	1712	1319	1721	1787	1455	1774	1787	1451
Q Serve(g_s), s	5.7	37.0	37.0	5.4	35.4	0.0	12.2	12.9	6.4	17.0	6.8	39.2
Cycle Q Clear(g_c), s	5.7	37.0	37.0	5.4	35.4	0.0	12.2	12.9	6.4	17.0	6.8	39.2
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	180	1102	567	180	1652	424	389	1119	455	262	1243	505
V/C Ratio(X)	0.95	1.04	1.05	0.91	0.97	0.00	0.94	0.45	0.24	1.01	0.24	0.99
Avail Cap(c_a), veh/h	180	1102	567	180	1652	424	389	1119	455	262	1243	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	0.50	0.50	0.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	54.3	39.0	39.0	54.2	38.4	0.0	50.6	31.6	29.3	49.0	26.7	37.2
Incr Delay (d2), s/veh	45.1	36.2	46.2	25.5	10.1	0.0	31.1	0.1	0.1	53.1	0.0	32.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	23.0	25.2	3.2	18.2	0.0	7.5	6.4	2.6	12.2	3.4	20.2
LnGrp Delay(d),s/veh	99.5	75.2	85.2	79.7	48.5	0.0	81.7	31.7	29.4	102.1	26.7	70.0
LnGrp LOS	F	F	F	E	D		F	C	C	F	C	E
Approach Vol, veh/h	1912		1765				978			1061		
Approach Delay, s/veh	80.5		51.4				50.2			65.9		
Approach LOS	F		D				D			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.0	43.0	17.0	45.0	10.0	43.0	21.0	41.0				
Change Period (Y+Rc), s	4.0	6.0	4.0	5.0	4.0	6.0	4.0	5.0				
Max Green Setting (Gmax), s	40.0	37.0	13.0	40.0	6.0	37.0	17.0	36.0				
Max Q Clear Time (g_c+I1), s	40.0	39.0	14.2	41.2	7.7	37.4	19.0	14.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3				
Intersection Summary												
HCM 2010 Ctrl Delay			63.6									
HCM 2010 LOS			E									

HCM 2010 Signalized Intersection Summary

9: Jones Rd & Treat Blvd

Cumulative Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  	 		 		 	 	 
Traffic Volume (veh/h)	108	1920	70	150	1600	368	120	42	500	418	52	120
Future Volume (veh/h)	108	1920	70	150	1600	368	120	42	500	418	52	120
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.95	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1881	1900	1863	1881	1881	1863	1881	1900	1863	1867	1881
Adj Flow Rate, veh/h	114	2021	71	158	1684	0	126	44	340	479	0	49
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	2	0	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	2	1	1	2	1	1	2	1	1
Cap, veh/h	138	1809	63	106	1929	601	449	45	350	701	0	294
Arrive On Green	0.04	0.36	0.36	0.06	0.38	0.00	0.25	0.25	0.25	0.20	0.00	0.20
Sat Flow, veh/h	3442	5085	178	1774	5136	1599	1774	179	1382	3548	0	1488
Grp Volume(v), veh/h	114	1359	733	158	1684	0	126	0	384	479	0	49
Grp Sat Flow(s),veh/h/ln	1721	1712	1840	1774	1712	1599	1774	0	1561	1774	0	1488
Q Serve(g_s), s	4.9	53.3	53.3	9.0	45.7	0.0	8.6	0.0	36.5	18.8	0.0	4.1
Cycle Q Clear(g_c), s	4.9	53.3	53.3	9.0	45.7	0.0	8.6	0.0	36.5	18.8	0.0	4.1
Prop In Lane	1.00		0.10	1.00		1.00	1.00		0.89	1.00		1.00
Lane Grp Cap(c), veh/h	138	1218	654	106	1929	601	449	0	395	701	0	294
V/C Ratio(X)	0.83	1.12	1.12	1.48	0.87	0.00	0.28	0.00	0.97	0.68	0.00	0.17
Avail Cap(c_a), veh/h	138	1218	654	106	1929	601	449	0	395	852	0	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	0.69	0.69	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	71.5	48.3	48.3	70.5	43.5	0.0	45.0	0.0	55.5	55.8	0.0	49.9
Incr Delay (d2), s/veh	3.7	53.4	56.5	249.1	4.1	0.0	0.1	0.0	37.4	1.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	34.2	37.3	11.8	22.3	0.0	4.2	0.0	19.9	9.4	0.0	1.7
LnGrp Delay(d),s/veh	75.2	101.8	104.8	319.6	47.6	0.0	45.1	0.0	92.9	56.9	0.0	50.0
LnGrp LOS	E	F	F	F	D		D		F	E		D
Approach Vol, veh/h	2206			1842			510			528		
Approach Delay, s/veh	101.4			70.9			81.1			56.2		
Approach LOS	F			E			F			E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.0	59.3		34.7	10.0	62.3		43.0				
Change Period (Y+Rc), s	4.0	6.0		5.0	4.0	6.0		5.0				
Max Green Setting (Gmax), s	47.0			36.0	6.0	50.0		38.0				
Max Q Clear Time (g_c+111), s	55.3			20.8	6.9	47.7		38.5				
Green Ext Time (p_c), s	0.0	0.0		1.0	0.0	2.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	83.6											
HCM 2010 LOS	F											
Notes												

HCM 2010 Signalized Intersection Summary

10: Cherry Ln & Treat Blvd

Cumulative Plus Project PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰	↑↑↑	↱		↰	↱		↰	↱
Traffic Volume (veh/h)	100	2758	80	80	1788	48	210	64	410	53	23	40
Future Volume (veh/h)	100	2758	80	80	1788	48	210	64	410	53	23	40
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.89
Adj Sat Flow, veh/h/ln	1863	1881	1881	1863	1881	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	104	2873	64	83	1862	48	219	67	368	55	24	10
Adj No. of Lanes	1	3	1	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	1	1	2	1	1	0	0	0	0	0	0
Cap, veh/h	127	2726	815	89	2617	67	49	0	495	47	13	440
Arrive On Green	0.07	0.53	0.53	0.05	0.51	0.51	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1774	5136	1536	1774	5143	132	0	0	1607	0	41	1430
Grp Volume(v), veh/h	104	2873	64	83	1239	671	286	0	368	79	0	10
Grp Sat Flow(s), veh/h/ln	1774	1712	1536	1774	1712	1852	0	0	1607	41	0	1430
Q Serve(g_s), s	7.5	69.0	2.7	6.1	36.2	36.3	0.0	0.0	26.7	0.0	0.0	0.6
Cycle Q Clear(g_c), s	7.5	69.0	2.7	6.1	36.2	36.3	40.0	0.0	26.7	40.0	0.0	0.6
Prop In Lane	1.00		1.00	1.00		0.07	0.77		1.00	0.70		1.00
Lane Grp Cap(c), veh/h	127	2726	815	89	1742	942	49	0	495	60	0	440
V/C Ratio(X)	0.82	1.05	0.08	0.94	0.71	0.71	5.85	0.00	0.74	1.32	0.00	0.02
Avail Cap(c_a), veh/h	207	2726	815	89	1742	942	49	0	495	60	0	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	59.5	30.5	14.9	61.5	24.6	24.6	65.0	0.0	40.4	56.6	0.0	31.4
Incr Delay (d2), s/veh	0.5	25.4	0.0	73.5	2.5	4.6	225.6	0.0	5.4	224.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	38.7	1.1	4.8	17.6	19.6	32.0	0.0	12.6	5.9	0.0	0.3
LnGrp Delay(d),s/veh	59.9	55.9	15.0	135.1	27.1	29.1	2290.6	0.0	45.8	281.5	0.0	31.4
LnGrp LOS	E	F	B	F	C	C	F		D	F		C
Approach Vol, veh/h	3041			1993			654			89		
Approach Delay, s/veh	55.2			32.3			1027.4			253.4		
Approach LOS	E			C			F			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.0	74.0		45.0	13.8	71.2		45.0				
Change Period (Y+Rc), s	4.5	5.0		5.0	4.5	5.0		5.0				
Max Green Setting (Gmax), s	69.0	5		40.0	15.2	60.3		40.0				
Max Q Clear Time (g_c+I), s	71.0	19		42.0	9.5	38.3		42.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.1	20.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	160.4											
HCM 2010 LOS	F											

Appendix C: Queue Worksheets

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Existing AM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	100	94	209	200	60	1469
v/c Ratio	0.59	0.52	0.59	0.77	0.09	0.48	0.83
Control Delay	67.8	52.9	68.4	70.7	12.0	72.7	32.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.8	52.9	68.4	70.7	12.0	72.7	32.5
Queue Length 50th (ft)	85	63	66	159	31	46	485
Queue Length 95th (ft)	164	136	142	280	72	107	#936
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	429	429	319	452	2148	452	1768
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.23	0.29	0.46	0.09	0.13	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Existing AM

	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	5	216	154	25	300	111	1092
v/c Ratio	0.03	0.01	no cap	0.23	0.24	0.24	0.57	0.92
Control Delay	41.0	0.0		5.7	58.3	32.4	58.7	48.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	0.0	Error	5.7	58.3	32.4	58.7	48.3
Queue Length 50th (ft)	~5	0	~268	0	14	45	62	313
Queue Length 95th (ft)	13	0	#535	49	51	102	149	#689
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	142	1094	1	657	562	1651	562	1184
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.00	216.00	0.23	0.04	0.18	0.20	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Existing AM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	85	71	99	77	238	42	121	1050
v/c Ratio	0.12	0.14	0.22	0.29	0.42	0.15	0.06	0.53	0.69
Control Delay	34.9	20.1	36.1	26.2	52.9	28.0	1.5	52.7	33.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	20.1	36.1	26.2	52.9	28.0	1.5	52.7	33.8
Queue Length 50th (ft)	21	12	40	36	53	68	0	83	~433
Queue Length 95th (ft)	52	34	83	85	102	108	7	144	#598
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	632	1172	632	626	535	1699	732	535	1518
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.07	0.11	0.16	0.14	0.14	0.06	0.23	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing AM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	394	968	1650	600	159	554	1030
v/c Ratio	0.82	0.38	0.60	0.84	0.39	0.67	2.05
Control Delay	76.4	9.4	13.5	26.8	51.9	57.0	502.2
Queue Delay	0.0	0.0	0.5	2.1	0.0	0.0	0.0
Total Delay	76.4	9.4	14.0	28.9	51.9	57.0	502.2
Queue Length 50th (ft)	195	184	303	510	132	261	~1449
Queue Length 95th (ft)	248	220	481	#754	206	328	#1716
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275				300		410
Base Capacity (vph)	572	2525	2769	714	410	829	503
Starvation Cap Reductn	0	0	594	41	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.38	0.76	0.89	0.39	0.67	2.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

Existing AM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	152	1822	406	1775	78	237	214	42	77	584	227
v/c Ratio	0.64	0.76	0.82	0.76	0.13	0.72	0.22	0.09	0.60	0.65	0.46
Control Delay	80.7	32.5	79.4	43.0	16.7	78.7	42.7	0.4	85.7	53.9	21.5
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Total Delay	80.7	32.5	79.4	43.1	16.7	79.5	42.7	0.4	85.7	53.9	21.5
Queue Length 50th (ft)	73	487	217	369	23	118	85	0	74	270	70
Queue Length 95th (ft)	m69	m338	m234	m417	m29	163	124	0	128	337	155
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		610	260		240			120
Base Capacity (vph)	251	2396	595	2335	610	389	986	445	188	905	492
Starvation Cap Reductn	0	0	0	65	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1	0	32	0	0	0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.76	0.68	0.78	0.13	0.66	0.22	0.09	0.41	0.65	0.47

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

Existing AM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	1589	241	2106	406	32	177	156	158	50
v/c Ratio	0.40	0.77	0.98	0.94	0.53	0.09	0.42	0.45	0.44	0.13
Control Delay	116.8	20.0	114.5	52.4	20.6	45.9	13.0	54.7	54.4	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.8	20.0	114.5	52.4	20.6	45.9	13.0	54.7	54.4	0.6
Queue Length 50th (ft)	31	461	238	~891	158	25	18	135	136	0
Queue Length 95th (ft)	m43	#512	#416	#1006	283	55	86	211	212	0
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	2069	247	2239	764	413	482	403	414	443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.77	0.98	0.94	0.53	0.08	0.37	0.39	0.38	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

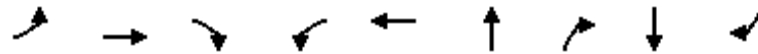
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Existing AM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	32	1638	109	86	2764	94	56	244	67
v/c Ratio	0.45	0.47	0.11	1.06	0.78	0.68	0.16	0.86	0.23
Control Delay	95.1	13.9	2.2	186.8	20.9	82.8	11.8	88.9	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.1	13.9	2.2	186.8	20.9	82.8	11.8	88.9	22.6
Queue Length 50th (ft)	34	273	0	~99	679	95	0	257	21
Queue Length 95th (ft)	73	380	25	#222	919	154	39	339	62
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3469	1037	81	3543	182	430	374	375
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.47	0.11	1.06	0.78	0.52	0.13	0.65	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Existing PM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	188	185	73	423	639	61	611
v/c Ratio	0.67	0.65	0.45	0.69	0.34	0.41	0.64
Control Delay	51.9	49.8	50.5	38.2	16.2	54.4	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	49.8	50.5	38.2	16.2	54.4	25.4
Queue Length 50th (ft)	113	109	38	221	118	36	118
Queue Length 95th (ft)	213	207	95	#488	215	88	200
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	570	578	437	612	2408	600	2274
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.32	0.17	0.69	0.27	0.10	0.27

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Existing PM



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	144	99	251	14	811	43	296
v/c Ratio	0.59	0.15	no cap	0.33	0.13	0.59	0.33	0.28
Control Delay	59.1	2.5		5.1	56.9	33.9	56.8	28.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	2.5	Error	5.1	56.9	33.9	56.8	28.3
Queue Length 50th (ft)	~100	0	~111	0	7	133	22	52
Queue Length 95th (ft)	108	26	#278	52	33	252	71	135
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	151	1247	1	769	640	1891	616	1352
Starvation Cap Reductn	0	0	0	0	0	10	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.12	99.00	0.33	0.02	0.43	0.07	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Existing PM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	289	111	317	70	611	52	64	517
v/c Ratio	0.32	0.47	0.26	0.71	0.36	0.53	0.10	0.35	0.49
Control Delay	38.5	10.4	30.2	34.9	44.7	25.7	3.1	45.0	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.5	10.4	30.2	34.9	44.7	25.7	3.1	45.0	25.3
Queue Length 50th (ft)	34	9	43	115	32	117	0	29	96
Queue Length 95th (ft)	78	37	108	252	87	234	10	81	198
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	683	1322	697	685	578	1752	773	567	1585
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.22	0.16	0.46	0.12	0.35	0.07	0.11	0.33
Intersection Summary									

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing PM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	526	1139	1614	644	79	190	533
v/c Ratio	0.94	0.45	0.61	0.83	0.19	0.23	1.16
Control Delay	86.9	10.2	19.9	21.9	47.9	47.6	130.0
Queue Delay	0.0	0.0	0.5	2.3	0.0	0.0	0.0
Total Delay	86.9	10.2	20.4	24.2	47.9	47.6	130.0
Queue Length 50th (ft)	264	232	289	215	63	80	~511
Queue Length 95th (ft)	#370	273	m383	m590	112	116	#745
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275				300		410
Base Capacity (vph)	572	2525	2652	776	410	829	461
Starvation Cap Reductn	0	0	535	54	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.45	0.76	0.89	0.19	0.23	1.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Oak Road & Treat Blvd

Existing PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	133	1523	139	1407	70	330	444	276	180	227	501
v/c Ratio	0.57	0.54	0.58	0.62	0.12	0.88	0.48	0.49	0.96	0.25	1.02
Control Delay	84.3	23.3	84.2	32.2	13.3	89.0	49.3	7.8	120.8	45.6	83.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	1.2
Total Delay	84.3	23.3	84.2	32.2	13.3	90.7	49.3	7.8	120.8	45.6	84.3
Queue Length 50th (ft)	65	245	71	253	10	165	194	0	178	93	~401
Queue Length 95th (ft)	m87	m264	m106	342	m39	#244	251	77	#334	132	#632
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		610	260		240			120
Base Capacity (vph)	251	2801	595	2270	585	389	929	567	188	905	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	12	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.54	0.23	0.62	0.12	0.88	0.48	0.49	0.96	0.25	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

Existing PM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	62	1803	135	1486	322	106	510	205	208	85
v/c Ratio	0.41	0.77	0.77	0.67	0.42	0.28	0.96	0.64	0.65	0.22
Control Delay	103.4	31.3	92.6	39.3	11.7	50.1	57.7	64.3	64.2	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	103.4	31.3	92.6	39.3	11.7	50.1	57.7	64.3	64.2	4.1
Queue Length 50th (ft)	28	518	131	484	57	85	269	184	187	0
Queue Length 95th (ft)	m53	m#663	199	558	151	142	#495	274	277	21
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	2329	247	2212	769	413	555	403	408	457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.77	0.55	0.67	0.42	0.26	0.92	0.51	0.51	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

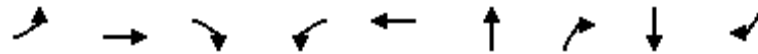
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Existing PM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	90	2498	59	71	1655	234	382	55	34
v/c Ratio	1.11	0.75	0.06	0.88	0.50	0.77	0.93	0.24	0.10
Control Delay	198.9	22.6	4.7	144.1	16.3	75.8	77.7	53.3	8.5
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	198.9	22.9	4.7	144.1	16.3	75.8	77.7	53.3	8.5
Queue Length 50th (ft)	~108	676	6	76	339	229	320	47	0
Queue Length 95th (ft)	#235	748	26	#178	385	332	#493	91	22
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3309	968	81	3295	342	452	253	381
Starvation Cap Reductn	0	295	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.83	0.06	0.88	0.50	0.68	0.85	0.22	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Project AM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	106	102	94	222	208	60	1471
v/c Ratio	0.59	0.54	0.60	0.78	0.10	0.49	0.84
Control Delay	68.7	54.4	69.2	70.8	11.9	73.6	33.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.7	54.4	69.2	70.8	11.9	73.6	33.6
Queue Length 50th (ft)	86	66	67	171	33	47	498
Queue Length 95th (ft)	166	141	144	297	74	109	#956
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	425	424	316	448	2157	448	1752
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.24	0.30	0.50	0.10	0.13	0.84

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Existing Plus Project AM

	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	4	5	220	175	25	303	115	1092
v/c Ratio	0.03	0.01	no cap	0.26	0.24	0.25	0.58	0.92
Control Delay	41.2	0.0		5.6	58.4	32.4	58.8	47.9
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	0.0	Error	5.6	58.4	32.4	58.8	47.9
Queue Length 50th (ft)	~5	0	~274	0	14	46	64	313
Queue Length 95th (ft)	13	0	#544	52	51	102	153	#688
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	142	1092	1	668	561	1646	561	1188
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.00	220.00	0.26	0.04	0.18	0.20	0.92

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Existing Plus Project AM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	87	71	99	77	241	42	121	1054
v/c Ratio	0.12	0.14	0.22	0.29	0.42	0.15	0.06	0.53	0.69
Control Delay	34.9	20.5	36.1	26.2	52.9	28.0	1.5	52.7	33.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	20.5	36.1	26.2	52.9	28.0	1.5	52.7	33.9
Queue Length 50th (ft)	21	13	40	36	53	69	0	83	~436
Queue Length 95th (ft)	52	35	83	85	102	110	7	144	#602
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	632	1176	632	626	535	1699	732	535	1518
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.07	0.11	0.16	0.14	0.14	0.06	0.23	0.69

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Project AM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	394	973	1674	600	159	555	1033
v/c Ratio	0.82	0.39	0.60	0.84	0.39	0.67	2.06
Control Delay	76.4	9.4	13.7	26.8	51.9	57.0	506.6
Queue Delay	0.0	0.0	0.5	2.1	0.0	0.0	0.0
Total Delay	76.4	9.4	14.3	28.9	51.9	57.0	506.6
Queue Length 50th (ft)	195	185	310	511	132	262	~1457
Queue Length 95th (ft)	248	221	511	#751	206	330	#1724
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275				300		410
Base Capacity (vph)	572	2525	2769	714	410	829	502
Starvation Cap Reductn	0	0	593	41	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.39	0.77	0.89	0.39	0.67	2.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

Existing Plus Project AM

												
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	154	1828	406	1797	78	237	215	42	77	586	229	
v/c Ratio	0.64	0.76	0.82	0.77	0.13	0.72	0.22	0.09	0.60	0.65	0.46	
Control Delay	80.7	32.5	79.3	43.5	16.7	78.7	42.8	0.4	85.7	53.9	21.5	
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0	
Total Delay	80.7	32.5	79.3	43.6	16.7	79.5	42.8	0.4	85.7	53.9	21.6	
Queue Length 50th (ft)	74	489	217	378	23	118	85	0	74	271	71	
Queue Length 95th (ft)	m71	m340	m232	m423	m29	163	125	0	128	338	157	
Internal Link Dist (ft)		663		697			535			896		
Turn Bay Length (ft)	150		240		610	260		240			120	
Base Capacity (vph)	251	2396	595	2335	610	389	986	445	188	905	493	
Starvation Cap Reductn	0	0	0	64	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	1	0	32	0	0	0	0	5	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.61	0.76	0.68	0.79	0.13	0.66	0.22	0.09	0.41	0.65	0.47	

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

Existing Plus Project AM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	67	1589	241	2106	410	32	178	163	165	72
v/c Ratio	0.44	0.77	0.98	0.94	0.54	0.09	0.42	0.47	0.46	0.18
Control Delay	117.1	20.1	114.5	52.8	20.7	45.9	13.2	55.2	54.9	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	117.1	20.1	114.5	52.8	20.7	45.9	13.2	55.2	54.9	2.1
Queue Length 50th (ft)	35	461	238	~895	161	25	19	142	144	0
Queue Length 95th (ft)	m48	#512	#416	#1006	287	55	87	220	222	8
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	2066	247	2232	763	413	482	403	414	443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.77	0.98	0.94	0.54	0.08	0.37	0.40	0.40	0.16

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

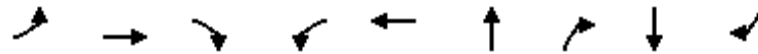
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Existing Plus Project AM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	32	1651	109	86	2769	95	56	252	67
v/c Ratio	0.45	0.48	0.11	1.06	0.79	0.68	0.16	0.87	0.22
Control Delay	95.1	14.3	2.2	186.8	21.4	82.5	11.8	90.8	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.1	14.3	2.2	186.8	21.4	82.5	11.8	90.8	22.5
Queue Length 50th (ft)	34	284	0	~99	701	96	0	265	20
Queue Length 95th (ft)	73	384	25	#222	923	157	39	352	62
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3448	1032	81	3522	180	430	370	375
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.48	0.11	1.06	0.79	0.53	0.13	0.68	0.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Project PM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	191	189	73	432	644	61	621
v/c Ratio	0.68	0.66	0.45	0.71	0.34	0.41	0.64
Control Delay	52.6	50.5	51.1	39.6	16.2	55.0	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.6	50.5	51.1	39.6	16.2	55.0	26.1
Queue Length 50th (ft)	116	112	38	231	120	36	125
Queue Length 95th (ft)	217	213	95	#511	217	89	207
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	564	571	433	606	2387	595	2254
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.33	0.17	0.71	0.27	0.10	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Existing Plus Project PM

								
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	89	144	103	266	14	821	60	296
v/c Ratio	0.60	0.16	no cap	0.35	0.14	0.61	0.42	0.25
Control Delay	60.7	2.6		5.2	57.8	35.5	59.0	27.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	2.6	Error	5.2	57.8	35.5	59.0	27.3
Queue Length 50th (ft)	~101	0	~117	0	7	137	31	52
Queue Length 95th (ft)	110	27	#289	53	33	260	91	135
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	149	1200	1	753	610	1799	587	1323
Starvation Cap Reductn	0	0	0	0	0	9	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.12	103.00	0.35	0.02	0.46	0.10	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Existing Plus Project PM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	292	111	317	70	620	53	64	520
v/c Ratio	0.32	0.47	0.26	0.71	0.36	0.53	0.10	0.35	0.50
Control Delay	38.6	10.7	30.2	34.9	44.9	25.8	3.2	45.1	25.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	10.7	30.2	34.9	44.9	25.8	3.2	45.1	25.4
Queue Length 50th (ft)	34	10	43	115	32	120	0	29	97
Queue Length 95th (ft)	78	38	108	252	87	238	10	81	201
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	681	1321	694	683	576	1746	771	565	1580
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.22	0.16	0.46	0.12	0.36	0.07	0.11	0.33
Intersection Summary									

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Project PM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	527	1158	1627	644	79	192	541
v/c Ratio	0.94	0.46	0.61	0.83	0.19	0.23	1.18
Control Delay	87.0	10.3	19.8	22.1	47.9	47.7	139.6
Queue Delay	0.0	0.0	0.5	2.4	0.0	0.0	0.0
Total Delay	87.0	10.3	20.4	24.4	47.9	47.7	139.6
Queue Length 50th (ft)	264	237	300	225	63	81	~535
Queue Length 95th (ft)	#371	280	m392	m590	112	118	#769
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275				300		410
Base Capacity (vph)	572	2525	2652	774	410	829	458
Starvation Cap Reductn	0	0	534	54	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.46	0.77	0.89	0.19	0.23	1.18

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Oak Road & Treat Blvd

Existing Plus Project PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	1542	139	1417	70	330	446	276	180	229	503
v/c Ratio	0.60	0.55	0.58	0.63	0.12	0.88	0.49	0.49	0.96	0.25	1.02
Control Delay	84.7	23.3	83.0	32.5	13.7	89.0	49.4	7.8	120.8	45.6	84.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	1.8	0.0	0.0	0.0	0.0	1.2
Total Delay	84.7	23.3	83.0	32.5	13.7	90.9	49.4	7.8	120.8	45.6	85.3
Queue Length 50th (ft)	69	249	71	265	11	165	195	0	178	94	~405
Queue Length 95th (ft)	m90	m266	m103	346	m37	#244	251	77	#334	134	#638
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		610	260		240			120
Base Capacity (vph)	251	2804	595	2267	584	389	929	567	188	905	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	13	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.55	0.23	0.63	0.12	0.88	0.48	0.49	0.96	0.25	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

Existing Plus Project PM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	81	1803	135	1486	331	106	512	210	213	96
v/c Ratio	0.51	0.78	0.77	0.70	0.44	0.28	0.96	0.66	0.66	0.25
Control Delay	104.9	31.3	92.6	41.0	12.0	50.0	58.8	64.8	64.7	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.9	31.3	92.6	41.0	12.0	50.0	58.8	64.8	64.7	5.9
Queue Length 50th (ft)	36	518	131	489	60	85	274	189	192	0
Queue Length 95th (ft)	m64	m#663	199	558	156	142	#503	281	285	32
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	2316	247	2120	751	413	554	403	408	457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.78	0.55	0.70	0.44	0.26	0.92	0.52	0.52	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

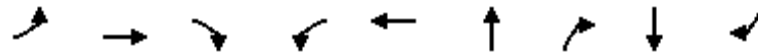
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Existing Plus Project PM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	90	2506	59	71	1672	238	382	61	34
v/c Ratio	1.11	0.76	0.06	0.88	0.51	0.78	0.93	0.28	0.10
Control Delay	198.9	22.7	4.7	144.1	16.4	76.9	78.0	54.5	8.5
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	198.9	23.0	4.7	144.1	16.4	76.9	78.0	54.5	8.5
Queue Length 50th (ft)	~108	683	6	76	345	234	320	53	0
Queue Length 95th (ft)	#235	753	26	#178	391	338	#494	100	22
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3307	967	81	3288	342	451	244	381
Starvation Cap Reductn	0	293	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.83	0.06	0.88	0.51	0.70	0.85	0.25	0.09

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Approved Projects AM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	109	113	236	269	67	1618
v/c Ratio	0.62	0.56	0.65	0.81	0.13	0.52	0.95
Control Delay	71.7	57.4	70.7	73.9	13.1	75.8	44.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.7	57.4	70.7	73.9	13.1	75.8	44.3
Queue Length 50th (ft)	96	74	82	188	46	54	637
Queue Length 95th (ft)	182	153	166	321	99	118	#1142
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	414	416	309	436	2113	436	1711
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.26	0.37	0.54	0.13	0.15	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Existing Plus Approved Projects AM

								
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	11	231	187	33	363	132	1220
v/c Ratio	0.08	0.02	no cap	0.28	0.29	0.30	0.62	1.02
Control Delay	43.0	0.1		5.6	59.7	34.2	59.1	67.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	0.1	Error	5.6	59.7	34.2	59.1	67.1
Queue Length 50th (ft)	~14	0	~292	0	19	58	74	374
Queue Length 95th (ft)	25	0	#573	54	63	126	172	#813
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	140	1085	1	672	557	1643	557	1194
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	231.00	0.28	0.06	0.22	0.24	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Existing Plus Approved Projects AM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	97	98	108	87	261	54	141	1163
v/c Ratio	0.24	0.16	0.30	0.32	0.47	0.21	0.10	0.59	0.88
Control Delay	36.9	21.8	37.9	27.5	54.4	29.1	3.8	54.0	41.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	21.8	37.9	27.5	54.4	29.1	3.8	54.0	41.5
Queue Length 50th (ft)	43	15	57	41	60	77	0	98	~528
Queue Length 95th (ft)	88	40	109	94	113	121	17	162	#702
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	575	1083	575	572	487	1475	646	487	1323
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.09	0.17	0.19	0.18	0.18	0.08	0.29	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Approved Projects AM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	406	1031	1740	625	177	1156	552
v/c Ratio	0.83	0.41	0.63	0.88	0.43	1.37	1.21
Control Delay	76.7	9.6	14.2	30.5	53.1	212.5	148.6
Queue Delay	0.0	0.0	0.6	3.3	0.0	0.0	0.0
Total Delay	76.7	9.6	14.9	33.9	53.1	212.5	148.6
Queue Length 50th (ft)	201	201	324	602	149	~760	~585
Queue Length 95th (ft)	255	238	582	#814	227	#908	#845
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	572	2525	2755	708	410	842	455
Starvation Cap Reductn	0	0	579	37	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.41	0.80	0.93	0.43	1.37	1.21

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

Existing Plus Approved Projects AM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	227	1897	423	1856	144	247	237	52	103	608	247
v/c Ratio	0.90	1.01	0.83	0.80	0.23	0.74	0.25	0.12	0.70	0.67	0.50
Control Delay	100.7	54.8	80.2	44.2	17.7	79.3	44.2	0.6	90.2	54.7	23.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Total Delay	100.7	54.8	80.2	44.4	17.7	80.7	44.2	0.6	90.2	54.7	23.1
Queue Length 50th (ft)	110	~726	226	392	52	122	96	0	99	283	83
Queue Length 95th (ft)	m118	m#669	m222	m391	m54	170	137	0	164	353	174
Internal Link Dist (ft)		663		388			535			896	
Turn Bay Length (ft)	150		240		320	260		240			120
Base Capacity (vph)	251	1873	595	2306	629	389	954	433	188	905	496
Starvation Cap Reductn	0	0	0	69	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	11	0	43	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	1.01	0.71	0.83	0.23	0.71	0.25	0.12	0.55	0.67	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

Existing Plus Approved Projects AM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	73	1667	250	2240	438	42	198	171	173	83
v/c Ratio	0.47	1.02	1.01	1.04	0.59	0.12	0.45	0.49	0.48	0.21
Control Delay	110.7	43.2	122.8	73.0	23.2	46.5	13.7	55.8	55.5	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.7	43.2	122.8	73.0	23.2	46.5	13.7	55.8	55.5	3.7
Queue Length 50th (ft)	38	~741	~251	~997	191	33	24	150	151	0
Queue Length 95th (ft)	m41	m#732	#436	#1104	327	68	96	229	231	18
Internal Link Dist (ft)		229		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	1634	247	2156	744	413	494	403	414	443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	1.02	1.01	1.04	0.59	0.10	0.40	0.42	0.42	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

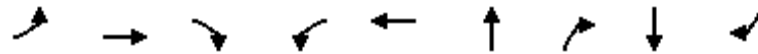
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Existing Plus Approved Projects AM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	42	1726	126	95	2916	116	63	253	74
v/c Ratio	0.57	0.50	0.12	1.17	0.83	0.97	0.18	0.91	0.24
Control Delay	104.7	14.9	2.1	215.7	23.8	139.8	11.2	98.2	25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.7	14.9	2.1	215.7	23.8	139.8	11.2	98.2	25.0
Queue Length 50th (ft)	44	311	0	~119	812	124	0	267	27
Queue Length 95th (ft)	#91	409	27	#248	1034	#231	42	358	72
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3429	1032	81	3497	149	435	349	375
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.50	0.12	1.17	0.83	0.78	0.14	0.72	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Existing Plus Approved Projects PM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	200	198	91	477	750	68	682
v/c Ratio	0.72	0.69	0.53	0.87	0.41	0.46	0.68
Control Delay	57.9	55.2	56.1	54.4	18.6	60.7	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	57.9	55.2	56.1	54.4	18.6	60.7	29.7
Queue Length 50th (ft)	132	128	53	297	158	44	160
Queue Length 95th (ft)	244	238	121	#661	280	103	256
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	513	521	394	551	2170	540	2068
Starvation Cap Reductn	0	0	0	0	308	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.38	0.23	0.87	0.40	0.13	0.33

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Existing Plus Approved Projects PM

								
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	149	114	287	23	954	57	356
v/c Ratio	0.69	0.17	no cap	0.38	0.22	0.65	0.42	0.29
Control Delay	67.6	2.6		5.2	58.3	36.0	60.2	27.7
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	2.6	Error	5.2	58.3	36.0	60.2	27.7
Queue Length 50th (ft)	~124	0	~138	0	13	164	32	63
Queue Length 95th (ft)	123	27	#313	55	47	306	88	163
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	149	1168	1	748	590	1742	567	1329
Starvation Cap Reductn	0	0	0	0	0	9	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.13	114.00	0.38	0.04	0.55	0.10	0.27
Intersection Summary								
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								

Queues

5: Oak Road & Wayne Dr

Existing Plus Approved Projects PM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	133	313	120	338	72	699	84	84	578
v/c Ratio	0.44	0.42	0.28	0.77	0.41	0.62	0.16	0.45	0.55
Control Delay	40.7	9.6	34.5	41.7	51.1	31.1	7.7	51.1	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	9.6	34.5	41.7	51.1	31.1	7.7	51.1	29.0
Queue Length 50th (ft)	68	12	52	140	37	165	0	44	130
Queue Length 95th (ft)	129	41	118	277	90	278	30	100	224
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	599	1203	610	606	506	1534	689	496	1399
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.26	0.20	0.56	0.14	0.46	0.12	0.17	0.41
Intersection Summary									

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Existing Plus Approved Projects PM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	546	1206	1732	670	93	531	283
v/c Ratio	0.96	0.44	0.59	0.83	0.30	0.82	0.82
Control Delay	90.2	7.6	16.0	21.6	54.3	56.9	53.2
Queue Delay	0.0	0.0	0.5	4.0	0.0	0.0	0.0
Total Delay	90.2	7.6	16.5	25.5	54.3	56.9	53.2
Queue Length 50th (ft)	276	201	329	284	80	221	182
Queue Length 95th (ft)	#392	296	m432	m663	128	275	291
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	572	2719	2917	809	410	809	417
Starvation Cap Reductn	0	0	632	80	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.44	0.76	0.92	0.23	0.66	0.68

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Oak Road & Treat Blvd

Existing Plus Approved Projects PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	153	1602	153	1469	92	347	459	286	245	276	561
v/c Ratio	0.64	0.73	0.60	0.65	0.16	0.91	0.50	0.50	1.30	0.30	1.14
Control Delay	84.2	31.0	81.8	33.6	13.8	93.0	49.5	8.1	219.4	46.4	121.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	0.1
Total Delay	84.2	31.0	81.8	33.6	13.8	104.7	49.5	8.1	219.4	46.4	121.8
Queue Length 50th (ft)	71	509	78	291	19	175	202	2	~306	115	~528
Queue Length 95th (ft)	m114	483	m104	362	m45	#263	260	81	#486	159	#766
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		320	260		240			120
Base Capacity (vph)	251	2196	595	2253	592	389	929	572	188	905	492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	34	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.73	0.26	0.65	0.16	0.98	0.49	0.50	1.30	0.30	1.15

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

Existing Plus Approved Projects PM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	84	1937	147	1558	358	116	537	220	222	105
v/c Ratio	0.52	1.12	0.80	0.76	0.49	0.29	0.99	0.68	0.68	0.27
Control Delay	104.7	89.9	94.3	43.7	13.5	49.7	65.5	65.9	65.6	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.7	89.9	94.3	43.7	13.5	49.7	65.5	65.9	65.6	7.5
Queue Length 50th (ft)	40	~904	143	524	77	94	317	200	201	0
Queue Length 95th (ft)	m57	m#1015	216	594	180	155	#567	295	296	41
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	1735	247	2042	737	413	549	403	408	457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	1.12	0.60	0.76	0.49	0.28	0.98	0.55	0.54	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

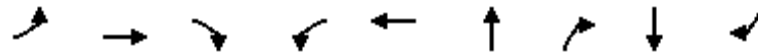
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Existing Plus Approved Projects PM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	94	2646	83	73	1750	250	396	63	42
v/c Ratio	1.16	0.81	0.09	0.90	0.54	0.80	0.94	0.28	0.12
Control Delay	212.2	25.2	5.2	149.4	17.4	77.9	80.0	53.9	12.1
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	212.2	25.8	5.2	149.4	17.4	77.9	80.0	53.9	12.1
Queue Length 50th (ft)	~116	777	11	79	378	246	337	54	0
Queue Length 95th (ft)	#244	837	35	#184	418	358	#527	103	32
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3271	961	81	3252	340	450	246	381
Starvation Cap Reductn	0	264	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.88	0.09	0.90	0.54	0.74	0.88	0.26	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

EPAP Plus Project AM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	111	113	249	277	67	1620
v/c Ratio	0.63	0.57	0.65	0.82	0.13	0.52	0.96
Control Delay	72.3	57.8	71.3	74.8	13.1	76.3	46.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.3	57.8	71.3	74.8	13.1	76.3	46.4
Queue Length 50th (ft)	97	76	83	201	48	55	655
Queue Length 95th (ft)	182	155	166	339	102	118	#1144
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	410	412	306	432	2120	432	1695
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.27	0.37	0.58	0.13	0.16	0.96

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

EPAP Plus Project AM



Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	11	235	208	33	366	136	1220
v/c Ratio	0.08	0.02	no cap	0.30	0.29	0.31	0.62	1.02
Control Delay	43.2	0.1		5.5	59.8	34.4	59.1	66.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	0.1	Error	5.5	59.8	34.4	59.1	66.3
Queue Length 50th (ft)	~14	0	~298	0	19	59	77	374
Queue Length 95th (ft)	25	0	#582	56	63	127	177	#812
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	140	1084	1	683	556	1638	556	1198
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	235.00	0.30	0.06	0.22	0.24	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

EPAP Plus Project AM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	98	98	108	87	264	54	141	1167
v/c Ratio	0.24	0.16	0.30	0.32	0.47	0.21	0.10	0.59	0.88
Control Delay	36.9	21.9	37.9	27.5	54.4	29.1	3.8	54.0	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.9	21.9	37.9	27.5	54.4	29.1	3.8	54.0	41.8
Queue Length 50th (ft)	43	16	57	41	60	78	0	98	~531
Queue Length 95th (ft)	88	40	109	94	113	122	17	162	#705
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	575	1083	575	572	487	1475	646	487	1323
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.09	0.17	0.19	0.18	0.18	0.08	0.29	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

EPAP Plus Project AM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	406	1036	1764	625	177	1159	553
v/c Ratio	0.83	0.41	0.64	0.88	0.43	1.38	1.22
Control Delay	76.7	9.7	14.5	30.4	53.1	214.7	151.7
Queue Delay	0.0	0.0	0.7	3.3	0.0	0.0	0.0
Total Delay	76.7	9.7	15.2	33.7	53.1	214.7	151.7
Queue Length 50th (ft)	201	202	332	602	149	~764	~591
Queue Length 95th (ft)	255	240	615	#812	227	#912	#853
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	572	2525	2755	708	410	841	453
Starvation Cap Reductn	0	0	577	37	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.41	0.81	0.93	0.43	1.38	1.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

EPAP Plus Project AM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	229	1904	423	1877	144	247	238	52	103	610	249
v/c Ratio	0.91	1.02	0.83	0.81	0.23	0.74	0.25	0.12	0.70	0.67	0.50
Control Delay	101.6	55.7	80.1	44.6	18.0	79.3	44.2	0.6	90.2	54.8	23.2
Queue Delay	0.0	0.0	0.0	0.2	0.0	1.4	0.0	0.0	0.0	0.0	0.0
Total Delay	101.6	55.7	80.1	44.8	18.0	80.7	44.2	0.6	90.2	54.8	23.2
Queue Length 50th (ft)	111	~732	226	401	52	122	96	0	99	285	84
Queue Length 95th (ft)	m120	m#672	m222	m398	m54	170	137	0	164	354	174
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		320	260		240			120
Base Capacity (vph)	251	1873	595	2306	628	389	954	433	188	905	497
Starvation Cap Reductn	0	0	0	68	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	12	0	43	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	1.02	0.71	0.84	0.23	0.71	0.25	0.12	0.55	0.67	0.51

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

EPAP Plus Project AM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	79	1667	250	2240	442	42	199	178	180	105
v/c Ratio	0.50	1.02	1.01	1.04	0.59	0.12	0.46	0.51	0.50	0.26
Control Delay	111.2	43.5	122.8	74.1	23.3	46.5	14.5	56.4	56.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.2	43.5	122.8	74.1	23.3	46.5	14.5	56.4	56.0	7.4
Queue Length 50th (ft)	41	~741	~251	~1001	194	33	28	156	158	0
Queue Length 95th (ft)	m44	m#728	#436	#1104	330	68	101	238	241	41
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	1631	247	2149	744	413	492	403	414	443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	1.02	1.01	1.04	0.59	0.10	0.40	0.44	0.43	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

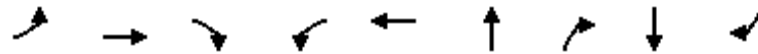
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

EPAP Plus Project AM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	42	1739	126	95	2921	117	63	261	74
v/c Ratio	0.57	0.51	0.12	1.17	0.84	0.97	0.17	0.93	0.24
Control Delay	104.7	15.2	2.1	215.7	24.4	139.2	11.2	99.9	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.7	15.2	2.1	215.7	24.4	139.2	11.2	99.9	24.8
Queue Length 50th (ft)	44	324	0	~119	838	125	0	275	26
Queue Length 95th (ft)	#91	414	27	#248	1038	#235	42	371	72
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3407	1027	81	3475	147	435	347	375
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.51	0.12	1.17	0.84	0.80	0.14	0.75	0.20

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

EPAP Plus Project PM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	204	201	91	486	756	68	693
v/c Ratio	0.72	0.70	0.53	0.89	0.41	0.47	0.68
Control Delay	58.5	55.6	56.8	58.4	18.7	61.4	30.1
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	58.5	55.6	56.8	58.4	18.8	61.4	30.1
Queue Length 50th (ft)	136	131	54	309	161	44	166
Queue Length 95th (ft)	250	242	122	#687	284	103	264
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	507	513	389	544	2143	533	2047
Starvation Cap Reductn	0	0	0	0	317	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.39	0.23	0.89	0.41	0.13	0.34

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

EPAP Plus Project PM

								
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	149	118	302	23	963	75	356
v/c Ratio	0.70	0.17	no cap	0.40	0.22	0.65	0.49	0.28
Control Delay	69.7	2.7		5.4	59.4	36.6	61.4	27.2
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	2.7	Error	5.4	59.4	36.6	61.4	27.2
Queue Length 50th (ft)	~127	0	~145	0	13	169	43	63
Queue Length 95th (ft)	125	28	#325	57	47	316	109	163
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	147	1149	1	748	579	1707	557	1347
Starvation Cap Reductn	0	0	0	0	0	8	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.13	118.00	0.40	0.04	0.57	0.13	0.26
Intersection Summary								
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								

Queues

5: Oak Road & Wayne Dr

EPAP Plus Project PM

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	133	317	120	338	72	708	86	84	582
v/c Ratio	0.44	0.43	0.28	0.77	0.41	0.63	0.16	0.45	0.55
Control Delay	40.7	9.8	34.6	41.8	51.2	31.2	7.6	51.1	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.7	9.8	34.6	41.8	51.2	31.2	7.6	51.1	29.1
Queue Length 50th (ft)	69	13	52	141	38	167	0	44	131
Queue Length 95th (ft)	129	42	118	277	90	282	31	100	226
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	597	1203	609	605	505	1531	689	495	1397
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.26	0.20	0.56	0.14	0.46	0.12	0.17	0.42
Intersection Summary									

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

EPAP Plus Project PM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	547	1225	1744	670	93	537	287
v/c Ratio	0.96	0.45	0.60	0.83	0.29	0.82	0.83
Control Delay	90.3	7.9	16.3	22.1	53.8	57.3	55.4
Queue Delay	0.0	0.0	0.5	4.2	0.0	0.0	0.0
Total Delay	90.3	7.9	16.8	26.3	53.8	57.3	55.4
Queue Length 50th (ft)	277	208	339	293	79	226	191
Queue Length 95th (ft)	#393	303	m439	m663	128	282	303
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	572	2708	2902	804	410	806	414
Starvation Cap Reductn	0	0	622	79	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.45	0.76	0.92	0.23	0.67	0.69

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

8: Oak Road & Treat Blvd

EPAP Plus Project PM

												
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Group Flow (vph)	160	1620	153	1480	92	347	461	286	245	278	563	
v/c Ratio	0.66	0.74	0.60	0.66	0.16	0.91	0.50	0.50	1.30	0.31	1.14	
Control Delay	85.2	31.1	81.1	34.0	14.0	93.0	49.6	8.1	219.4	46.5	123.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	12.3	0.0	0.0	0.0	0.0	0.1	
Total Delay	85.2	31.1	81.1	34.0	14.0	105.3	49.6	8.1	219.4	46.5	123.3	
Queue Length 50th (ft)	75	517	78	302	20	175	203	2	~306	116	~532	
Queue Length 95th (ft)	m119	493	m103	366	m44	#263	261	81	#486	160	#770	
Internal Link Dist (ft)		663		697			535			896		
Turn Bay Length (ft)	150		240		320	260		240			120	
Base Capacity (vph)	251	2196	595	2250	591	389	929	572	188	905	492	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	35	0	0	0	0	4	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.64	0.74	0.26	0.66	0.16	0.98	0.50	0.50	1.30	0.31	1.15	

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

9: Jones Rd & Treat Blvd

EPAP Plus Project PM



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	103	1937	147	1558	366	116	539	224	228	116
v/c Ratio	0.61	1.13	0.80	0.77	0.50	0.28	0.99	0.69	0.69	0.30
Control Delay	107.5	94.4	94.3	44.5	13.7	49.5	65.8	66.4	66.5	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	107.5	94.4	94.3	44.5	13.7	49.5	65.8	66.4	66.5	9.4
Queue Length 50th (ft)	48	~904	143	528	80	94	323	204	208	0
Queue Length 95th (ft)	m68	m#1015	216	594	185	155	#572	301	305	53
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	183	1718	247	2014	733	413	548	403	408	457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	1.13	0.60	0.77	0.50	0.28	0.98	0.56	0.56	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

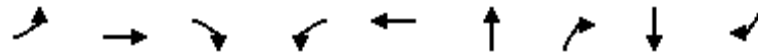
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

EPAP Plus Project PM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	94	2654	83	73	1767	254	396	69	42
v/c Ratio	1.16	0.81	0.09	0.90	0.54	0.81	0.94	0.32	0.12
Control Delay	212.2	25.3	5.2	149.4	17.5	79.2	80.0	55.3	12.1
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	212.2	25.9	5.2	149.4	17.5	79.2	80.0	55.3	12.1
Queue Length 50th (ft)	~116	782	11	79	384	251	337	60	0
Queue Length 95th (ft)	#244	842	35	#184	424	364	#527	110	32
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	81	3271	961	81	3252	340	450	236	381
Starvation Cap Reductn	0	264	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.88	0.09	0.90	0.54	0.75	0.88	0.29	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative No Project AM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	120	124	258	280	67	1742
v/c Ratio	0.69	0.60	0.93	0.91	0.12	0.58	0.95
Control Delay	78.0	58.4	119.9	92.4	10.6	84.4	42.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.0	58.4	119.9	92.4	10.6	84.4	42.1
Queue Length 50th (ft)	118	87	104	232	47	60	741
Queue Length 95th (ft)	189	154	#250	#428	85	116	#1050
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	307	316	133	286	2248	149	1843
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.38	0.93	0.90	0.12	0.45	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Cumulative No Project AM

	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	11	253	198	33	396	132	1319
v/c Ratio	0.08	0.02	no cap	0.29	0.29	0.33	0.62	1.10
Control Delay	43.0	0.1		5.5	59.7	34.4	59.1	93.3
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	0.1	Error	5.5	59.7	34.4	59.1	93.3
Queue Length 50th (ft)	~14	0	~319	0	19	64	74	~460
Queue Length 95th (ft)	25	0	#617	55	63	136	172	#907
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	140	1085	1	678	557	1637	557	1194
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	253.00	0.29	0.06	0.24	0.24	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Cumulative No Project AM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	108	109	119	87	283	54	152	1250
v/c Ratio	0.25	0.18	0.34	0.36	0.49	0.25	0.10	0.63	1.00
Control Delay	37.0	20.1	38.5	30.3	55.3	29.9	3.9	54.5	59.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	20.1	38.5	30.3	55.3	29.9	3.9	54.5	59.8
Queue Length 50th (ft)	43	15	64	51	60	85	0	105	~597
Queue Length 95th (ft)	88	41	119	107	113	132	17	172	#775
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	542	1017	542	543	458	1389	613	458	1249
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.11	0.20	0.22	0.19	0.20	0.09	0.33	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative No Project AM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	438	1115	1885	667	188	1245	599
v/c Ratio	1.16	0.56	0.89	1.10	0.31	1.09	1.10
Control Delay	138.8	15.3	34.2	92.5	25.6	84.2	95.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	138.8	15.3	34.2	92.5	25.6	84.2	95.9
Queue Length 50th (ft)	~171	224	400	~457	87	~475	~439
Queue Length 95th (ft)	#269	283	471	#679	143	#616	#675
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	377	2005	2110	609	614	1145	547
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.56	0.89	1.10	0.31	1.09	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

Cumulative No Project AM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	237	2051	464	2010	155	268	258	52	113	660	268
v/c Ratio	0.79	1.02	1.03	0.88	0.25	1.03	0.28	0.12	0.78	0.71	0.52
Control Delay	83.6	68.1	111.5	42.7	7.0	127.7	44.6	0.6	98.4	53.2	23.3
Queue Delay	0.0	4.9	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.6	72.9	111.5	44.8	7.0	127.7	44.6	0.6	98.4	53.2	23.3
Queue Length 50th (ft)	114	~745	~241	630	14	~139	104	0	106	298	92
Queue Length 95th (ft)	#174	#839	#355	700	59	#234	146	0	#197	370	185
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		320	260		240			120
Base Capacity (vph)	307	2005	449	2277	626	260	914	425	158	936	514
Starvation Cap Reductn	0	27	0	151	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	1.04	1.03	0.95	0.25	1.03	0.28	0.12	0.72	0.71	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

9: Jones Rd & Treat Blvd

Cumulative No Project AM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	83	1802	271	2417	469	42	208	187	188	83
v/c Ratio	0.61	1.11	1.10	1.11	0.62	0.12	0.47	0.53	0.52	0.21
Control Delay	89.4	102.8	135.6	87.8	16.9	46.5	13.6	57.2	56.7	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.4	102.8	135.6	87.8	16.9	46.5	13.6	57.2	56.7	3.7
Queue Length 50th (ft)	42	~867	~296	~1115	104	33	24	166	166	0
Queue Length 95th (ft)	#74	#963	m#343	#1199	m156	68	98	250	250	18
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	137	1628	247	2178	751	413	501	403	414	443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.11	1.10	1.11	0.62	0.10	0.42	0.46	0.45	0.19

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

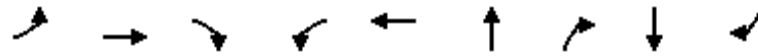
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Cumulative No Project AM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	42	1874	137	105	3158	127	63	284	84
v/c Ratio	0.76	0.61	0.15	0.70	0.93	0.92	0.16	0.93	0.23
Control Delay	86.3	23.1	3.4	89.6	29.2	114.3	5.5	92.6	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.3	23.1	3.4	89.6	29.2	114.3	5.5	92.6	10.9
Queue Length 50th (ft)	43	262	8	101	963	123	0	275	3
Queue Length 95th (ft)	m49	m227	m7	165	#1265	#226	25	#376	47
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	55	3082	938	194	3408	169	477	375	429
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.61	0.15	0.54	0.93	0.75	0.13	0.76	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative No Project PM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	215	217	91	511	807	68	739
v/c Ratio	0.74	0.73	0.54	0.97	0.44	0.48	0.70
Control Delay	60.2	58.7	59.0	73.4	19.6	63.9	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	60.2	58.7	59.0	73.4	19.7	63.9	31.0
Queue Length 50th (ft)	149	148	56	348	181	46	185
Queue Length 95th (ft)	269	268	126	#771	318	107	292
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	491	499	377	527	2077	517	1985
Starvation Cap Reductn	0	0	0	0	347	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.43	0.24	0.97	0.47	0.13	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Cumulative No Project PM

								
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	161	126	299	23	1023	57	379
v/c Ratio	0.69	0.18	no cap	0.40	0.22	0.66	0.43	0.30
Control Delay	67.6	2.5		5.3	59.0	36.0	61.3	27.5
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	2.5	Error	5.3	59.0	36.1	61.3	27.5
Queue Length 50th (ft)	~130	0	~158	0	13	179	33	67
Queue Length 95th (ft)	123	28	#337	56	47	332	88	173
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	149	1146	1	743	575	1700	553	1352
Starvation Cap Reductn	0	0	0	0	0	38	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.14	126.00	0.40	0.04	0.62	0.10	0.28
Intersection Summary								
~ Volume exceeds capacity, queue is theoretically infinite. Queue shown is maximum after two cycles.								
# 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.								

Queues

5: Oak Road & Wayne Dr

Cumulative No Project PM

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	133	325	133	362	84	747	84	84	614
v/c Ratio	0.45	0.44	0.29	0.78	0.46	0.66	0.16	0.46	0.60
Control Delay	41.9	9.5	34.6	42.6	52.7	32.6	7.7	52.7	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.9	9.5	34.6	42.6	52.7	32.6	7.7	52.7	31.0
Queue Length 50th (ft)	74	13	61	162	47	191	0	47	151
Queue Length 95th (ft)	129	41	128	#327	100	300	30	100	244
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	567	1160	578	578	480	1454	657	470	1317
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.28	0.23	0.63	0.17	0.51	0.13	0.18	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative No Project PM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	588	1299	1866	722	103	568	309
v/c Ratio	1.03	0.49	0.66	0.92	0.30	0.83	0.87
Control Delay	104.9	9.1	26.1	44.4	52.3	58.5	63.6
Queue Delay	0.0	0.0	0.7	4.1	0.0	0.0	0.0
Total Delay	104.9	9.1	26.8	48.5	52.3	58.5	63.6
Queue Length 50th (ft)	~315	252	469	555	86	247	230
Queue Length 95th (ft)	#438	331	554	#896	140	312	#362
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	572	2651	2817	782	410	792	402
Starvation Cap Reductn	0	0	532	31	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.49	0.82	0.96	0.25	0.72	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

Cumulative No Project PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	1735	163	1592	102	367	500	316	265	296	602
v/c Ratio	0.91	1.06	0.91	0.96	0.22	0.95	0.45	0.58	1.02	0.24	0.99
Control Delay	102.0	78.8	102.0	53.7	6.6	85.0	33.1	22.5	108.8	27.3	64.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.0	78.8	102.0	53.7	6.6	85.0	33.1	22.5	108.8	27.3	64.0
Queue Length 50th (ft)	62	~516	62	422	0	141	155	106	~202	81	373
Queue Length 95th (ft)	#129	#614	#129	#529	39	#234	205	203	#375	116	#619
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		320	260		240			120
Base Capacity (vph)	179	1632	179	1652	471	388	1118	547	261	1243	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	1.06	0.91	0.96	0.22	0.95	0.45	0.58	1.02	0.24	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

9: Jones Rd & Treat Blvd

Cumulative No Project PM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	95	2095	158	1684	379	126	568	242	243	116
v/c Ratio	0.69	1.15	1.49	0.87	0.54	0.28	1.20	0.73	0.72	0.29
Control Delay	96.0	118.2	308.6	50.1	16.6	47.1	147.8	68.8	68.1	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.0	118.2	308.6	50.1	16.6	47.1	147.8	68.8	68.1	9.3
Queue Length 50th (ft)	48	~966	~213	598	106	100	~587	223	224	0
Queue Length 95th (ft)	#92	#1059	#365	#711	217	160	#825	324	325	53
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	137	1816	106	1932	706	448	472	403	409	457
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	1.15	1.49	0.87	0.54	0.28	1.20	0.60	0.59	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

10: Cherry Ln & Treat Blvd

Cumulative No Project PM

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	104	2865	83	83	1896	282	427	73	42
v/c Ratio	0.66	0.95	0.09	0.94	0.68	0.82	0.90	0.31	0.10
Control Delay	76.2	34.8	6.2	142.3	24.4	63.6	57.7	40.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.2	34.8	6.2	142.3	24.4	63.6	57.7	40.7	0.5
Queue Length 50th (ft)	86	809	10	71	417	222	274	49	0
Queue Length 95th (ft)	145	#1046	37	#178	552	311	389	89	0
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	206	3011	898	88	2796	423	557	292	498
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.95	0.09	0.94	0.68	0.67	0.77	0.25	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative Plus Project AM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	127	122	124	272	288	67	1744
v/c Ratio	0.69	0.61	0.93	0.95	0.13	0.58	0.95
Control Delay	78.1	58.6	119.9	100.5	10.7	84.4	42.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.1	58.6	119.9	100.5	10.7	84.4	42.4
Queue Length 50th (ft)	118	88	104	246	49	60	743
Queue Length 95th (ft)	189	156	#250	#460	87	116	#1053
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	306	316	133	285	2252	148	1840
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.39	0.93	0.95	0.13	0.45	0.95

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Cumulative Plus Project AM

	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	11	11	257	219	33	399	136	1319
v/c Ratio	0.08	0.02	no cap	0.32	0.29	0.34	0.62	1.10
Control Delay	43.2	0.1		5.5	59.8	34.5	59.1	92.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	43.2	0.1	Error	5.5	59.8	34.5	59.1	92.1
Queue Length 50th (ft)	~14	0	~325	0	19	65	77	~460
Queue Length 95th (ft)	25	0	#628	58	63	137	177	#906
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	140	1084	1	690	556	1633	556	1198
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.01	257.00	0.32	0.06	0.24	0.24	1.10

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Cumulative Plus Project AM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	109	109	119	87	286	54	152	1254
v/c Ratio	0.25	0.18	0.34	0.36	0.49	0.25	0.10	0.63	1.00
Control Delay	37.0	20.3	38.5	30.3	55.3	29.9	3.9	54.5	60.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	20.3	38.5	30.3	55.3	29.9	3.9	54.5	60.6
Queue Length 50th (ft)	43	16	64	51	60	86	0	105	~601
Queue Length 95th (ft)	88	41	119	107	113	133	17	172	#779
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	542	1018	542	543	458	1389	613	458	1248
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.11	0.20	0.22	0.19	0.21	0.09	0.33	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative Plus Project AM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	438	1120	1909	667	188	1248	600
v/c Ratio	1.28	0.60	0.99	1.15	0.28	1.02	1.02
Control Delay	180.8	16.8	47.2	110.8	20.9	57.4	69.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.8	16.8	47.2	110.8	20.9	57.4	69.4
Queue Length 50th (ft)	~163	222	388	~417	73	~383	~356
Queue Length 95th (ft)	#257	285	#509	#631	124	#541	#600
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	343	1858	1928	581	668	1229	587
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.28	0.60	0.99	1.15	0.28	1.02	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

Cumulative Plus Project AM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	239	2058	464	2032	155	268	259	52	113	662	270
v/c Ratio	0.84	1.03	1.03	0.88	0.25	1.03	0.28	0.12	0.78	0.71	0.53
Control Delay	90.5	69.0	111.5	42.2	6.8	127.7	44.6	0.6	98.4	53.3	23.5
Queue Delay	0.0	5.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.5	74.0	111.5	44.7	6.8	127.7	44.6	0.6	98.4	53.3	23.5
Queue Length 50th (ft)	117	~750	~241	632	14	~139	105	0	106	300	94
Queue Length 95th (ft)	#188	#844	#355	702	58	#234	147	0	#197	372	189
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		320	260		240			120
Base Capacity (vph)	284	2005	449	2303	631	260	914	425	158	936	514
Starvation Cap Reductn	0	27	0	170	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	1.04	1.03	0.95	0.25	1.03	0.28	0.12	0.72	0.71	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

9: Jones Rd & Treat Blvd

Cumulative Plus Project AM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	90	1802	271	2417	473	42	209	192	197	105
v/c Ratio	0.66	1.11	1.10	1.11	0.63	0.12	0.47	0.54	0.54	0.26
Control Delay	92.9	103.7	135.3	88.6	17.2	46.5	14.3	57.6	57.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.9	103.7	135.3	88.6	17.2	46.5	14.3	57.6	57.4	7.4
Queue Length 50th (ft)	45	~867	~296	~1115	112	33	28	171	175	0
Queue Length 95th (ft)	#84	#963	m#340	#1199	m155	68	103	258	263	41
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	137	1625	247	2174	751	413	499	403	414	443
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	1.11	1.10	1.11	0.63	0.10	0.42	0.48	0.48	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

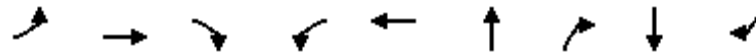
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

10: Cherry Ln & Treat Blvd

Cumulative Plus Project AM



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	42	1886	137	105	3163	128	63	292	84
v/c Ratio	0.76	0.62	0.15	0.70	0.93	0.92	0.15	0.94	0.23
Control Delay	86.6	23.5	3.5	89.6	30.2	112.9	5.5	93.2	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.6	23.5	3.5	89.6	30.2	112.9	5.5	93.2	10.8
Queue Length 50th (ft)	43	268	9	101	991	123	0	282	3
Queue Length 95th (ft)	m50	m230	m7	165	#1269	#229	25	#404	47
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	55	3060	932	194	3386	168	477	375	429
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.62	0.15	0.54	0.93	0.76	0.13	0.78	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

1: Oak Road & Buskirk Ave/Elena Ct

Cumulative Plus Project PM



Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	218	221	91	520	813	68	749
v/c Ratio	0.74	0.74	0.54	1.00	0.44	0.48	0.70
Control Delay	61.0	59.5	60.2	81.1	19.7	65.0	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	61.0	59.5	60.2	81.1	19.9	65.0	31.3
Queue Length 50th (ft)	154	154	57	~374	186	47	192
Queue Length 95th (ft)	277	276	129	#808	324	109	301
Internal Link Dist (ft)		188	277		502		596
Turn Bay Length (ft)	170			150		130	
Base Capacity (vph)	485	492	373	520	2055	511	1963
Starvation Cap Reductn	0	0	0	0	375	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.45	0.24	1.00	0.48	0.13	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

2: Oak Road & Las Juntas Way

Cumulative Plus Project PM

	→	↘	←	↖	↙	↑	↗	↓
Lane Group	EBT	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	161	129	314	23	1032	75	379
v/c Ratio	0.70	0.18	no cap	0.42	0.23	0.66	0.50	0.29
Control Delay	69.7	2.6		5.4	60.0	36.5	62.7	27.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	2.6	Error	5.4	60.0	36.6	62.7	27.0
Queue Length 50th (ft)	~131	0	~164	0	14	185	44	67
Queue Length 95th (ft)	125	29	#348	57	47	342	109	173
Internal Link Dist (ft)	312		1041			394		502
Turn Bay Length (ft)		170			150		170	
Base Capacity (vph)	147	1124	1	742	561	1659	540	1362
Starvation Cap Reductn	0	0	0	0	0	34	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.14	129.00	0.42	0.04	0.64	0.14	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

5: Oak Road & Wayne Dr

Cumulative Plus Project PM

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	133	329	133	362	84	757	86	84	618
v/c Ratio	0.45	0.45	0.29	0.78	0.46	0.67	0.16	0.46	0.60
Control Delay	42.0	9.8	34.6	42.7	52.7	32.7	7.6	52.8	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	9.8	34.6	42.7	52.7	32.7	7.6	52.8	31.1
Queue Length 50th (ft)	74	14	61	163	47	194	0	47	152
Queue Length 95th (ft)	129	43	128	#327	100	304	31	100	245
Internal Link Dist (ft)		736		237		896			394
Turn Bay Length (ft)	260				240		240	190	
Base Capacity (vph)	566	1160	577	576	479	1450	657	469	1314
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.28	0.23	0.63	0.18	0.52	0.13	0.18	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

7: I-680 Off-Ramp/Buskirk Ave & Treat Blvd

Cumulative Plus Project PM



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT	NBR
Lane Group Flow (vph)	589	1318	1878	722	103	574	313
v/c Ratio	1.03	0.50	0.67	0.93	0.29	0.83	0.88
Control Delay	105.3	9.3	26.5	45.4	52.0	58.9	65.5
Queue Delay	0.0	0.0	0.7	3.9	0.0	0.0	0.0
Total Delay	105.3	9.3	27.2	49.3	52.0	58.9	65.5
Queue Length 50th (ft)	~316	265	480	566	85	251	237
Queue Length 95th (ft)	#440	339	560	#898	140	317	#386
Internal Link Dist (ft)		654	663			534	
Turn Bay Length (ft)	275			350	300		410
Base Capacity (vph)	572	2643	2805	778	410	790	400
Starvation Cap Reductn	0	0	517	28	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.50	0.82	0.96	0.25	0.73	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

8: Oak Road & Treat Blvd

Cumulative Plus Project PM

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	170	1753	163	1602	102	367	502	316	265	298	604
v/c Ratio	0.95	1.07	0.91	0.97	0.22	0.95	0.45	0.58	1.02	0.24	0.99
Control Delay	110.1	82.5	102.0	54.8	6.6	85.0	33.1	22.5	108.8	27.3	64.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.1	82.5	102.0	54.8	6.6	85.0	33.1	22.5	108.8	27.3	64.8
Queue Length 50th (ft)	65	~526	62	426	0	141	155	106	~202	82	375
Queue Length 95th (ft)	#136	#624	#129	#534	39	#234	206	203	#375	117	#622
Internal Link Dist (ft)		663		697			535			896	
Turn Bay Length (ft)	150		240		320	260		240			120
Base Capacity (vph)	179	1632	179	1652	471	388	1118	547	261	1243	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	1.07	0.91	0.97	0.22	0.95	0.45	0.58	1.02	0.24	0.99

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

9: Jones Rd & Treat Blvd

Cumulative Plus Project PM

										
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	114	2095	158	1684	387	126	570	246	249	126
v/c Ratio	0.83	1.16	1.49	0.87	0.55	0.28	1.21	0.74	0.74	0.31
Control Delay	112.4	119.5	308.6	50.3	16.8	47.1	150.6	69.3	68.9	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	112.4	119.5	308.6	50.3	16.8	47.1	150.6	69.3	68.9	9.1
Queue Length 50th (ft)	58	~966	~213	598	109	100	~593	227	230	0
Queue Length 95th (ft)	#116	#1059	#365	#711	223	160	#832	330	332	53
Internal Link Dist (ft)		697		975			546		892	
Turn Bay Length (ft)	380		200			370		240		
Base Capacity (vph)	137	1812	106	1928	708	448	471	403	409	465
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	1.16	1.49	0.87	0.55	0.28	1.21	0.61	0.61	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

10: Cherry Ln & Treat Blvd

Cumulative Plus Project PM

									
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	104	2873	83	83	1913	286	427	79	42
v/c Ratio	0.66	0.95	0.09	0.94	0.68	0.83	0.90	0.34	0.10
Control Delay	76.2	35.1	6.2	142.3	24.6	64.9	57.7	41.9	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.2	35.1	6.2	142.3	24.6	64.9	57.7	41.9	0.5
Queue Length 50th (ft)	86	814	10	71	423	226	274	54	0
Queue Length 95th (ft)	145	#1051	37	#178	560	317	389	96	0
Internal Link Dist (ft)		975			625	540		455	
Turn Bay Length (ft)	190			180			110		70
Base Capacity (vph)	206	3011	898	88	2793	422	557	283	498
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.95	0.09	0.94	0.68	0.68	0.77	0.28	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Appendix D: Signal Warrants

Major Street Las Juntas Way
Minor Street Coggins Dr

Project Del Hombre
Scenario Existing No Project
Peak Hour AM

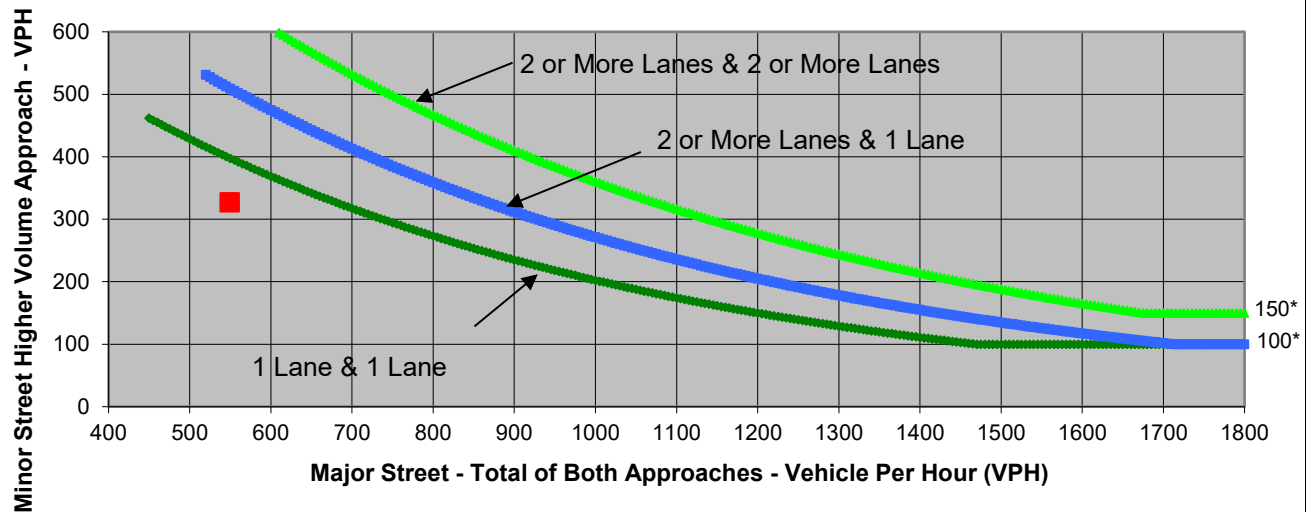
Turn Movement Volumes

	NB	SB	EB	WB
Left	95	55	17	107
Through	61	241	43	192
Right	44	53	37	28
Total	200	349	97	327

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Las Juntas Way	Coggins Dr	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	549	327	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Las Juntas Way
Minor Street Coggins Dr

Project Del Hombre
Scenario Existing Plus Project
Peak Hour AM

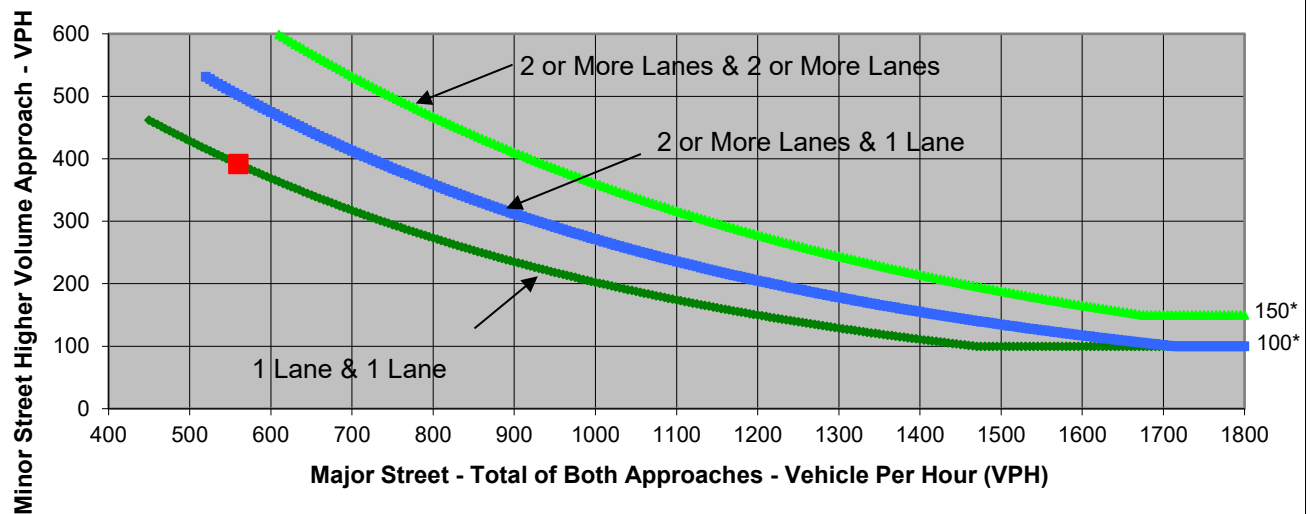
Turn Movement Volumes

	NB	SB	EB	WB
Left	95	56	17	142
Through	61	241	51	215
Right	54	53	37	35
Total	210	350	105	392

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Las Juntas Way	Coggins Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	560	392	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Las Juntas Way
Minor Street Coggins Dr

Project Del Hombre
Scenario Cumulative Plus Project
Peak Hour AM

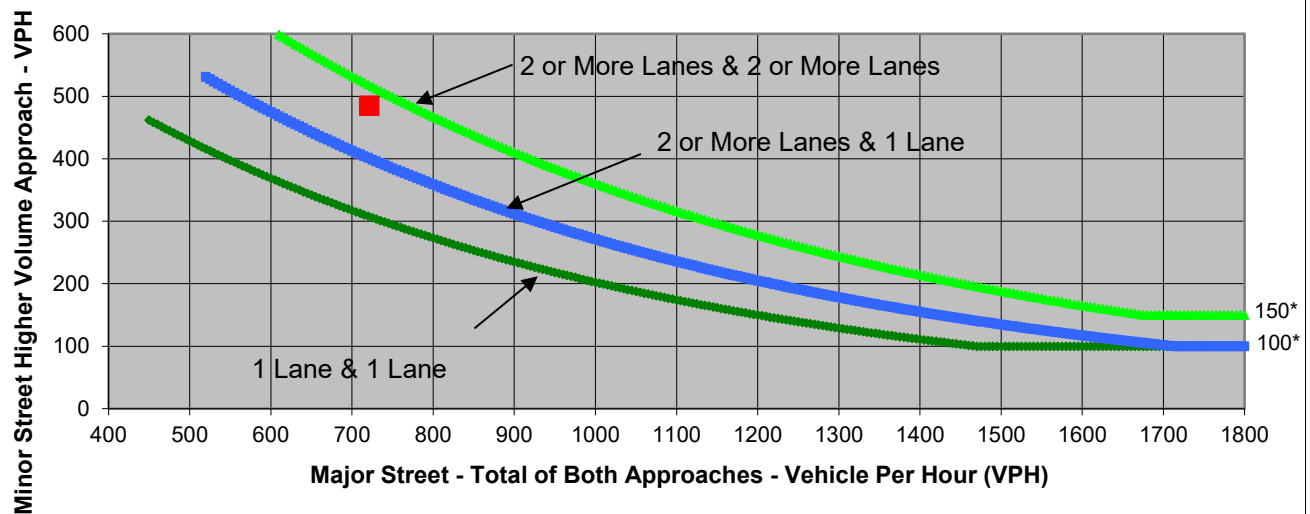
Turn Movement Volumes

	NB	SB	EB	WB
Left	120	81	20	165
Through	90	290	68	263
Right	70	70	50	57
Total	280	441	138	485

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Las Juntas Way	Coggins Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	721	485	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Las Juntas Way
Minor Street Coggins Dr

Project Del Hombre
Scenario Cumulative Plus Project
Peak Hour AM

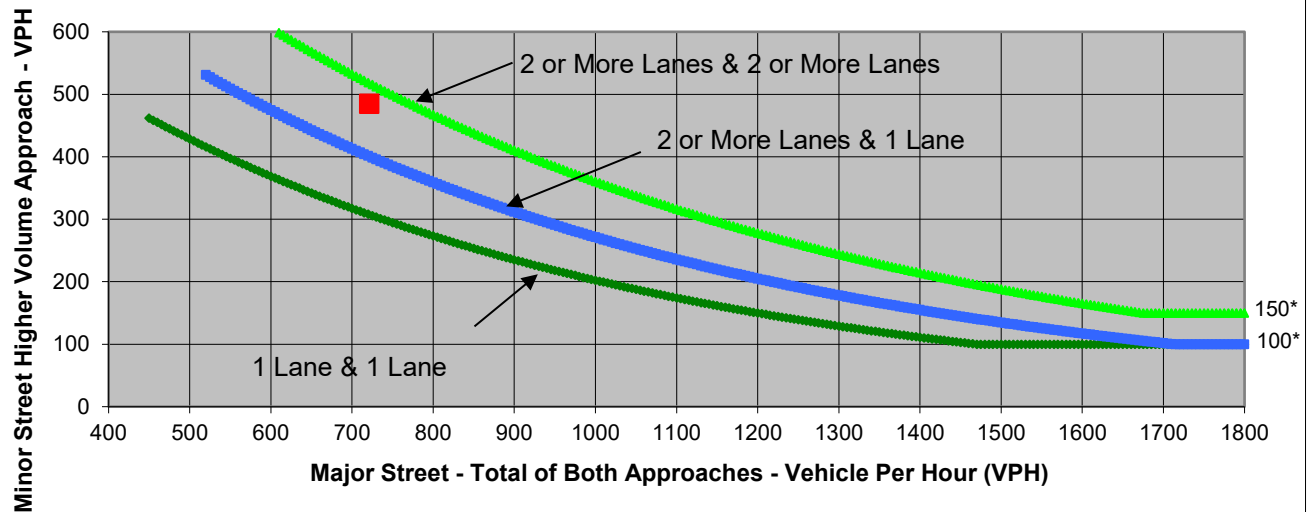
Turn Movement Volumes

	NB	SB	EB	WB
Left	120	81	20	165
Through	90	290	68	263
Right	70	70	50	57
Total	280	441	138	485

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Las Juntas Way	Coggins Dr	
Number of Approach Lanes	1	1	<u>YES</u>
Traffic Volume (VPH) *	721	485	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Las Juntas Way
Minor Street Coggins Dr

Project Del Hombre
Scenario Cumulative Plus Project
Peak Hour PM

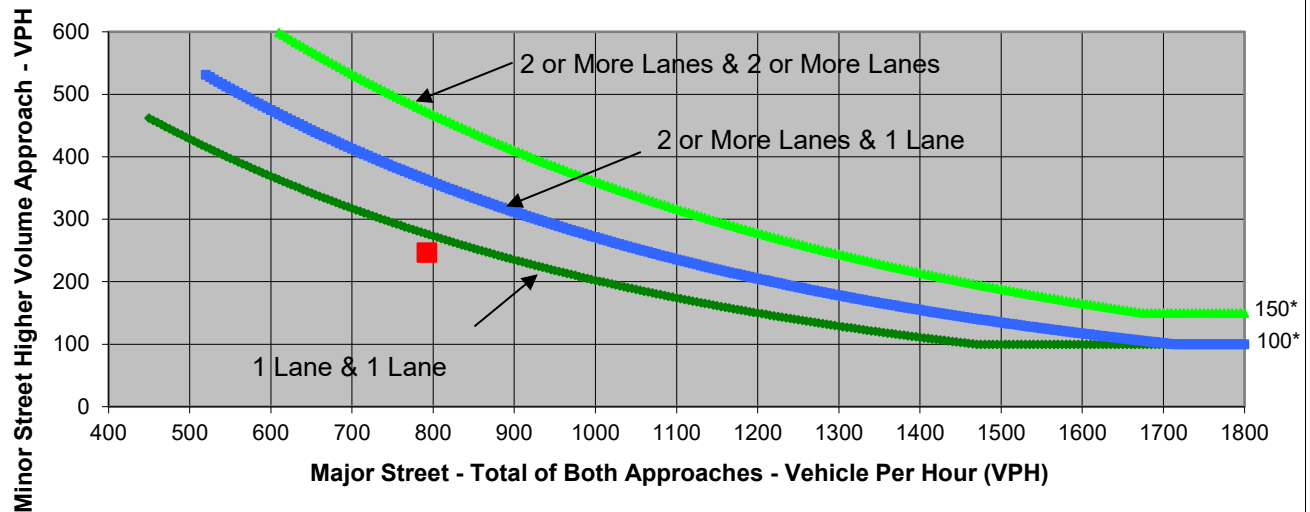
Turn Movement Volumes

	NB	SB	EB	WB
Left	170	94	30	79
Through	200	180	177	106
Right	108	40	40	55
Total	478	314	247	240

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Las Juntas Way	Coggins Dr	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	792	247	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Las Juntas Way/Del Hombre
 Minor Street Las Juntas Way/Roble Rd

Project Del Hombre
 Scenario Cumulative Plus Project
 Peak Hour AM

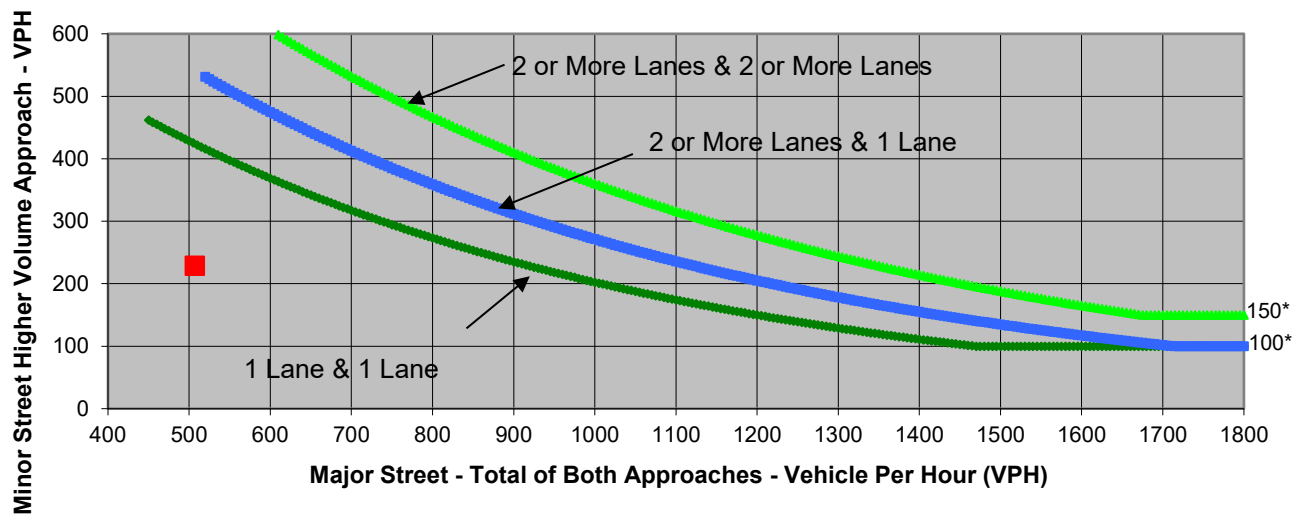
Turn Movement Volumes

	NB	SB	EB	WB
Left	86	10	160	0
Through	26	15	30	30
Right	10	360	39	10
Total	122	385	229	40

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Las Juntas Way/Del Hombre	Las Juntas Way/Roble Rd	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	507	229	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Las Juntas Way/Del Hombre
 Minor Street Las Juntas Way/Roble Rd

Project Del Hombre
 Scenario Cumulative Plus Project
 Peak Hour PM

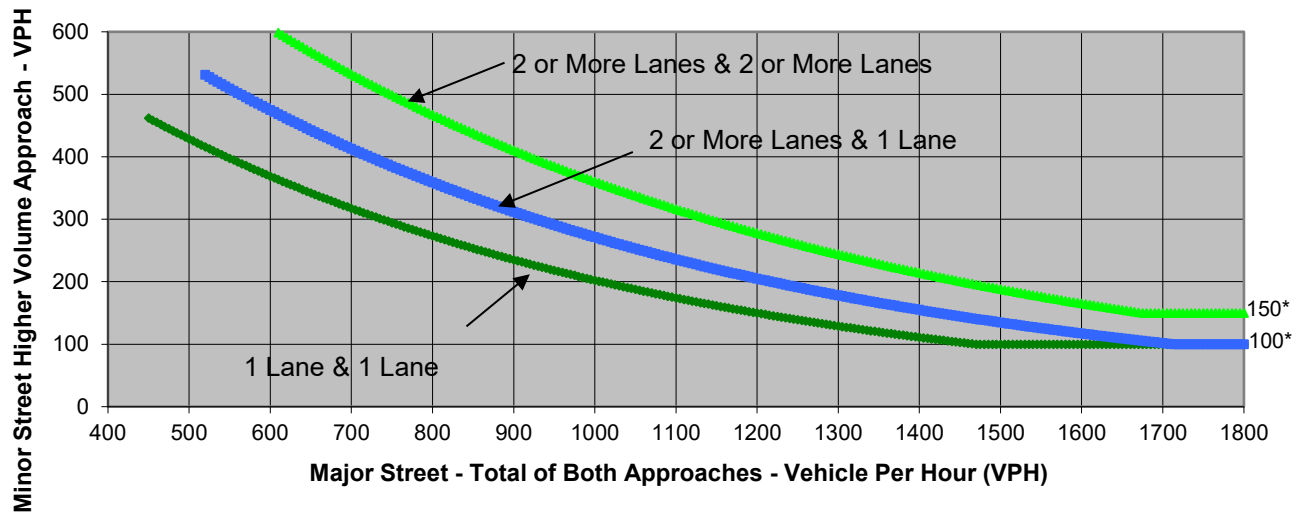
Turn Movement Volumes

	NB	SB	EB	WB
Left	50	10	270	10
Through	21	30	40	20
Right	10	160	69	10
Total	81	200	379	40

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Las Juntas Way/Del Hombre	Las Juntas Way/Roble Rd	
Number of Approach Lanes	1	1	<u>NO</u>
Traffic Volume (VPH) *	281	379	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Jones Rd
Minor Street Coggins Dr

Project Del Hombre
Scenario Cumulative Plus Project
Peak Hour AM

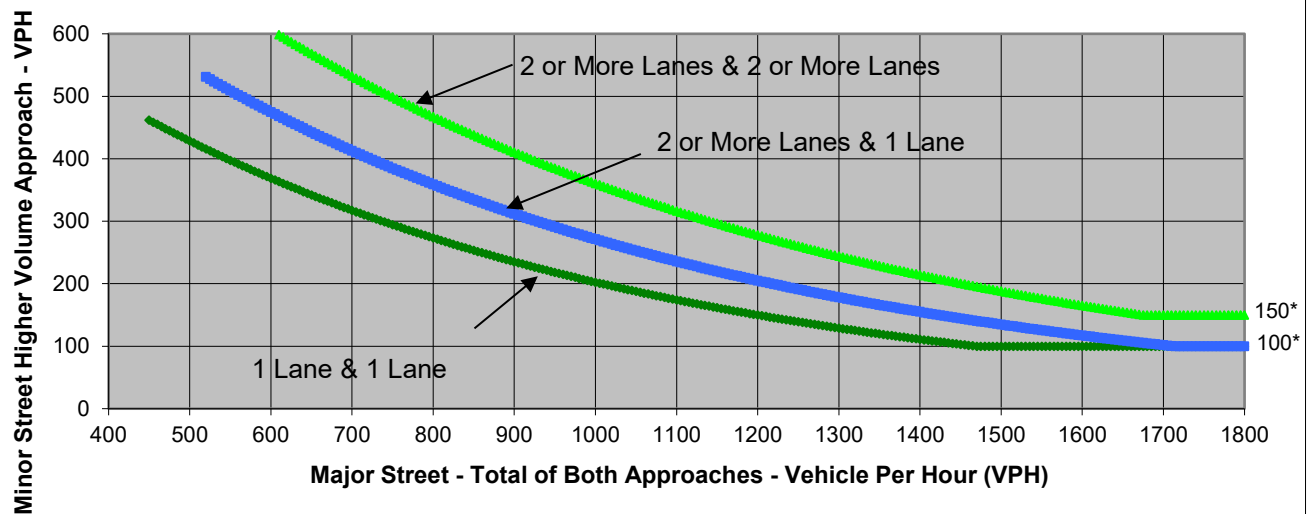
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	313	21	6
Through	4	8	41	154
Right	6	139	1	158
Total	10	460	63	318

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Jones Rd	Coggins Dr	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	381	460	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Major Street Jones Rd
Minor Street Coggins Dr

Project Del Hombre
Scenario Cumulative Plus Project
Peak Hour AM

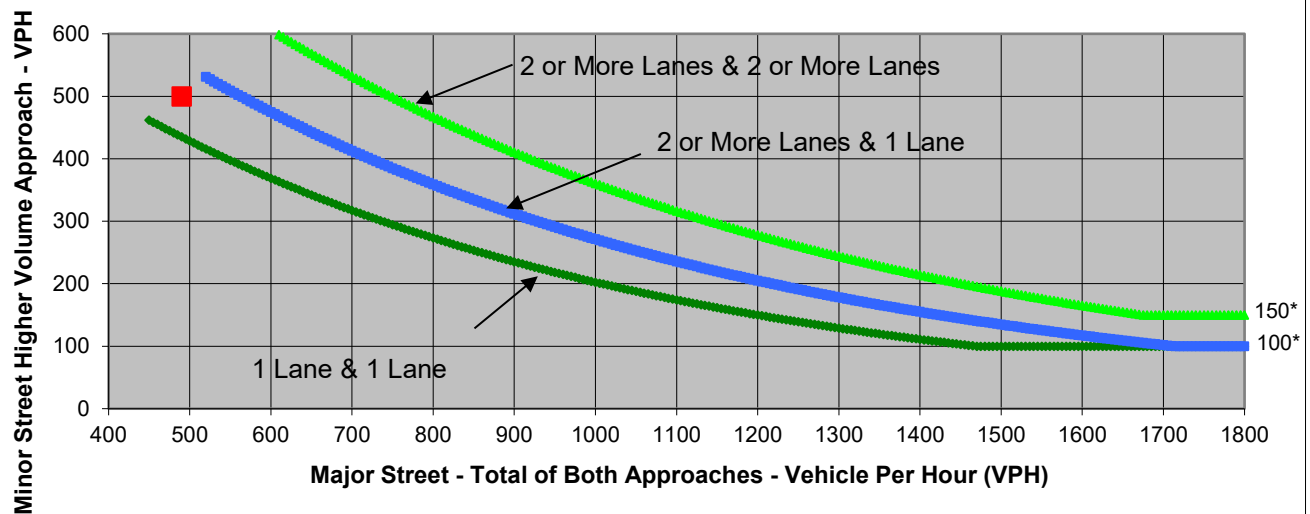
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	330	40	10
Through	10	10	50	180
Right	10	160	10	200
Total	20	500	100	390

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Jones Rd	Coggins Dr	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	490	500	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Jones Rd
Minor Street Coggins Dr

Project Del Hombre
Scenario Cumulative Plus Project
Peak Hour AM

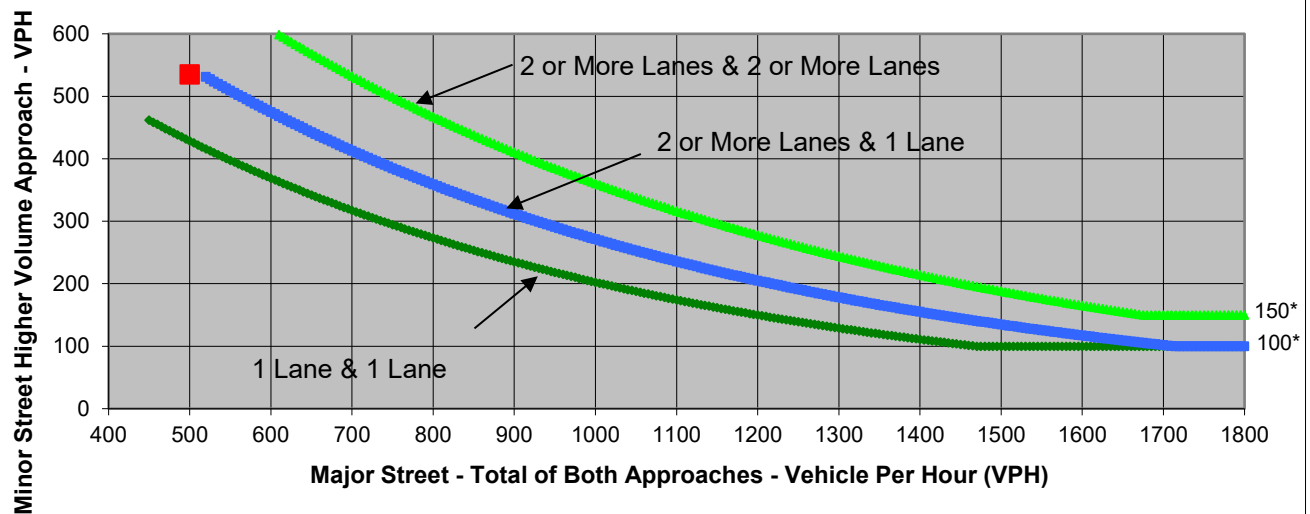
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	365	40	10
Through	10	10	50	180
Right	10	160	10	210
Total	20	535	100	400

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Jones Rd	Coggins Dr	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	500	535	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Major Street Jones Rd
Minor Street Coggins Dr

Project Del Hombre
Scenario Cumulative Plus Project
Peak Hour PM

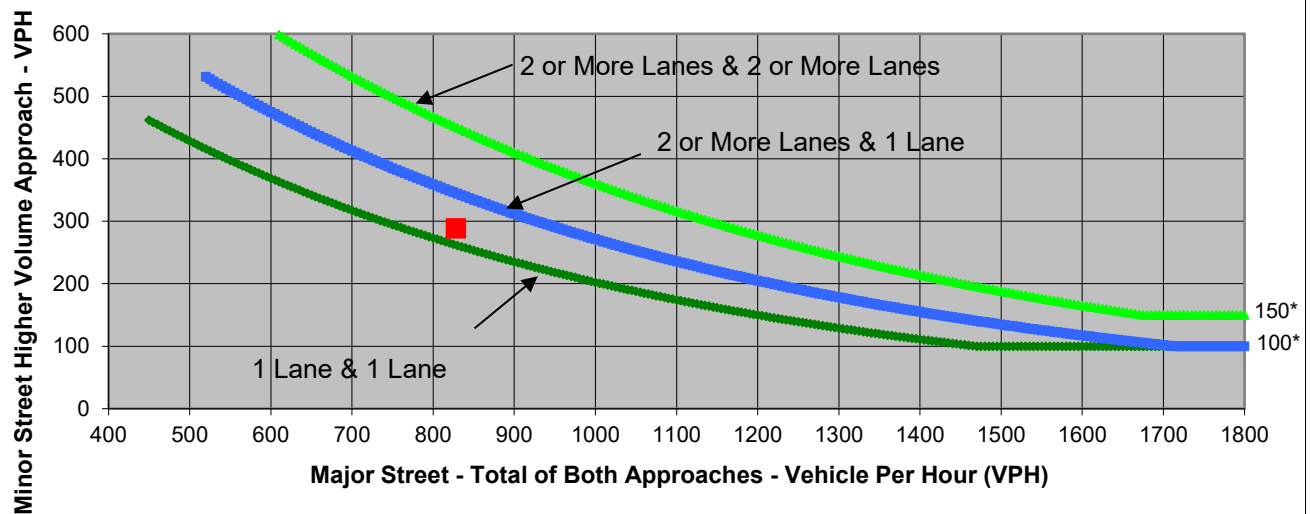
Turn Movement Volumes

	NB	SB	EB	WB
Left	0	229	170	10
Through	10	20	300	40
Right	10	40	0	308
Total	20	289	470	358

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour

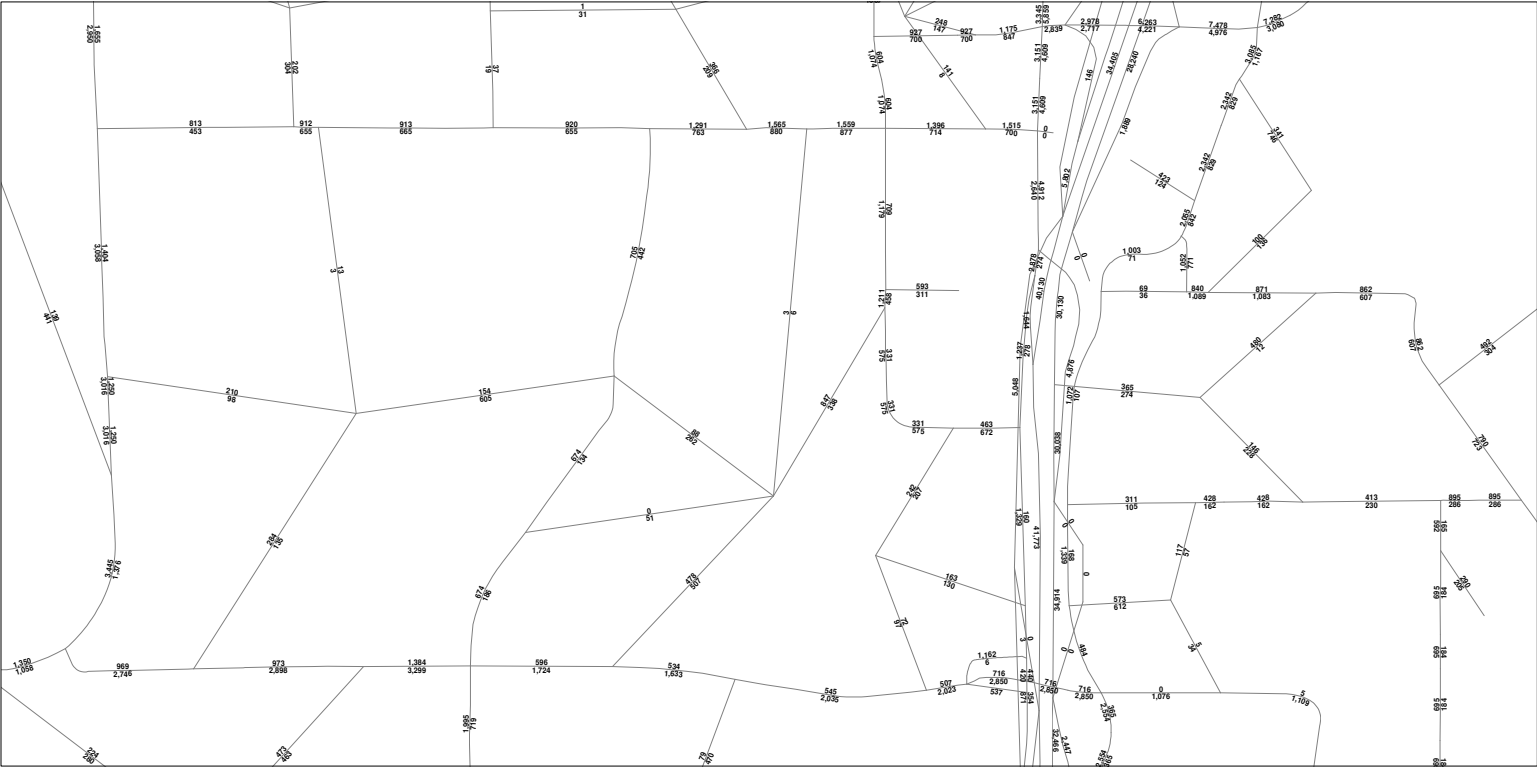


* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

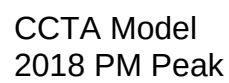
Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

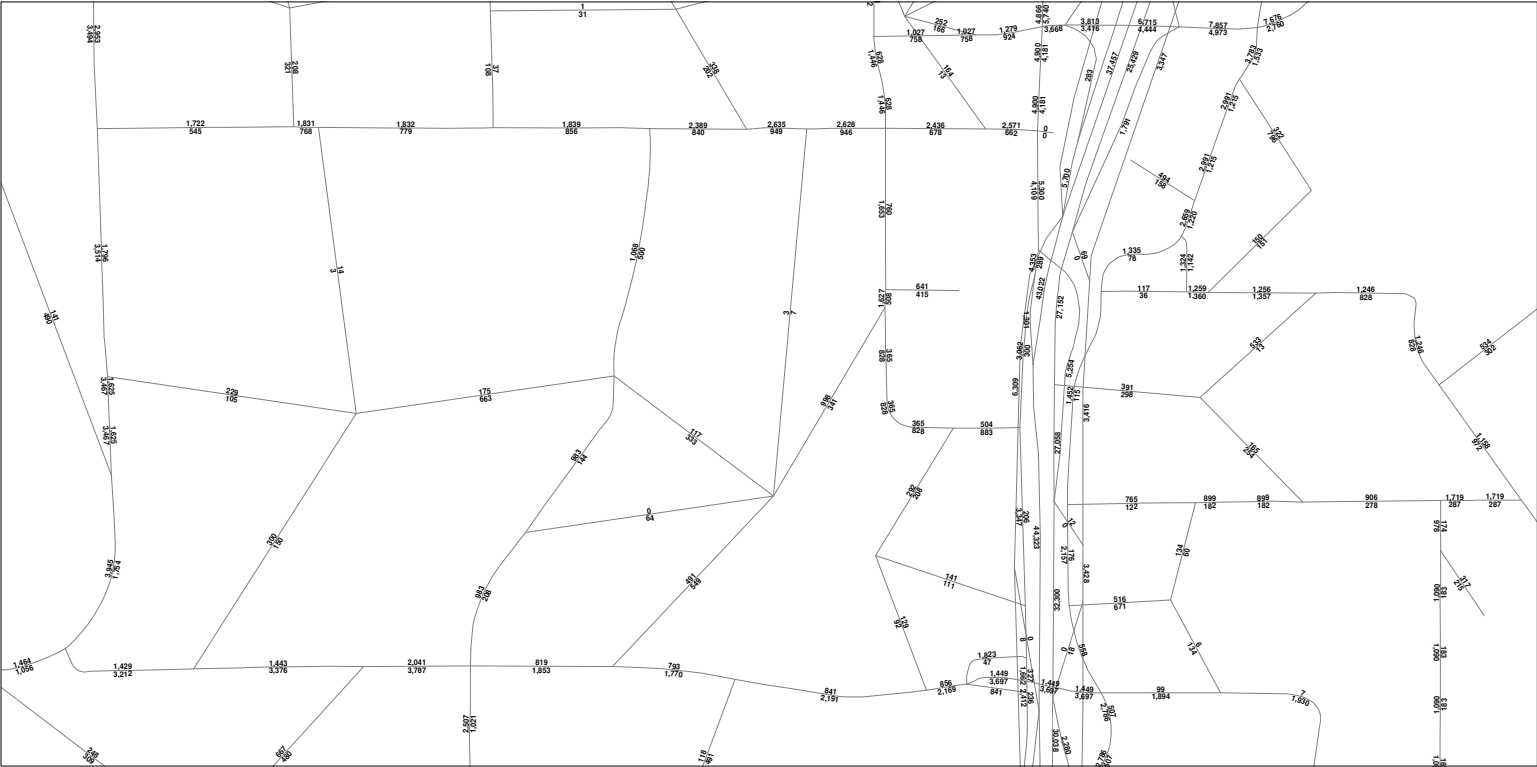
	Major Street	Minor Street	Warrant Met
	Jones Rd	Coggins Dr	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	828	289	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			

Appendix E: Model Plots

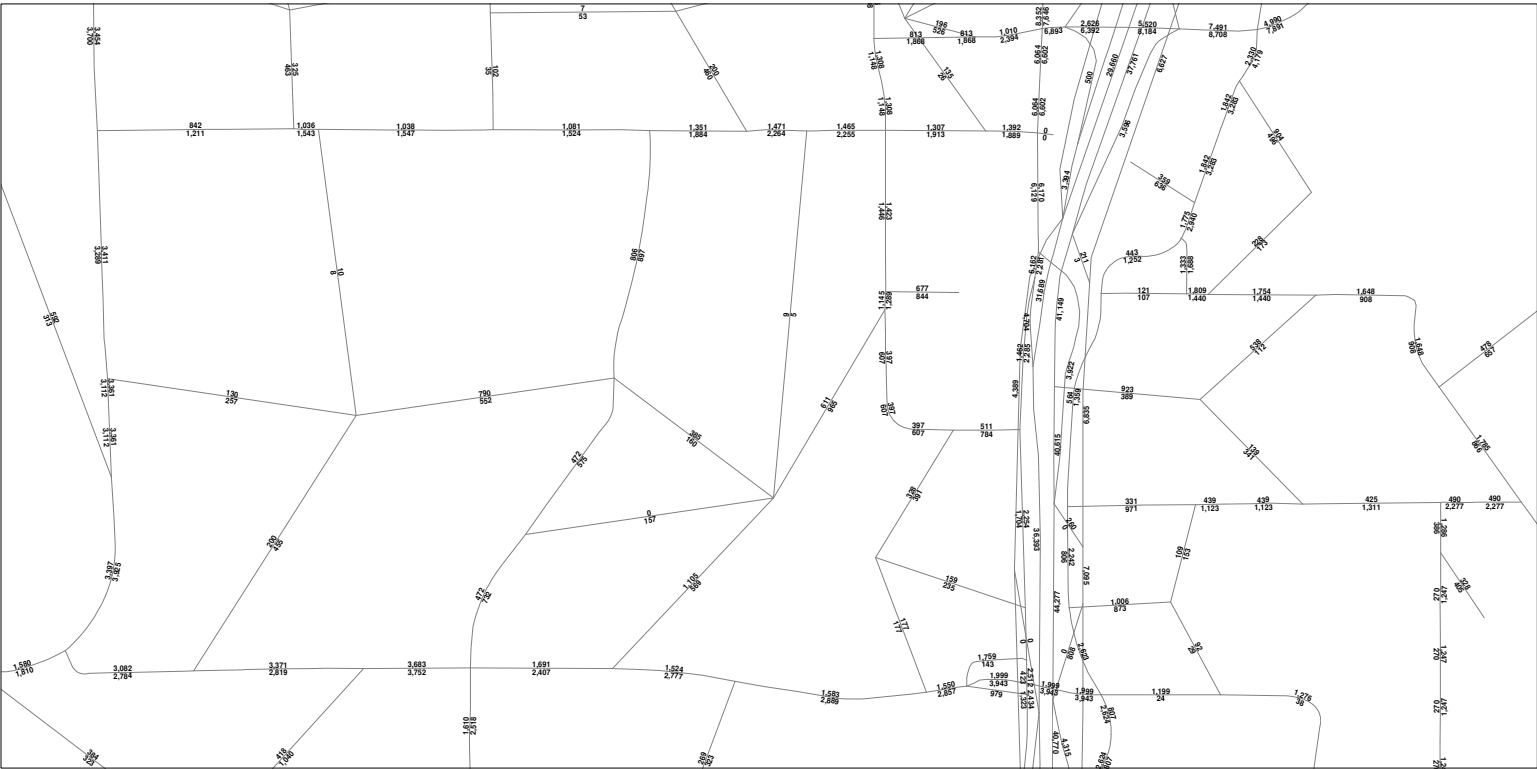


CCTA Model
2018 AM Peak

CCTA Model
2018 PM Peak



CCTA Model
2040 AM Peak



CCTA Model
2040 PM Peak

Appendix E
Del Hombre Apartments
Approved and Pending Projects Trip Generation

1. Cambria Hotel

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Hotel	310	155	1,900	56	40	96	55	58	113
TNC Factor		0.15	290	6	8	14	9	8	17
Existing Resturant		2	-840	-1	-2	-3	-52	-30	-82
Total			1,350	61	46	107	12	36	48

2. Day Care center at the intersection of Boyd Road at Kahrs Avenue

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Preschool/Day Care	565	72	290	30	26	56	27	30	57

3. Fountainhead Day Care Center

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Preschool/Day Care	565	72	290	30	26	56	27	30	57

4. Housing Element Opportunity Site on Cleaveland

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Multi-Family Housing	220	200	1,630	21	71	92	75	65	140

5. 85 Cleaveland

Land Use	ITE Code	Units	Daily	AM Peak Hour (8 to 9 AM)			PM Peak Hour (5 to 6 PM)		
				In	Out	Total	In	Out	Total
Multi-Family Housing	220	221	1,800	23	79	102	83	72	155

Appendix F: Approved Project Information and Trip Generation



CITY OF CONCORD

CURRENT PROJECTS REPORT

SEPTEMBER – DECEMBER

2018

CITY OF CONCORD
RETAIL/SERVICE COMMERCIAL DEVELOPMENT

Application Number(s)	Project Name	Applicant	Building Square Footage	Gross Parcel Acreage	Assessor's Parcel Number(s)	Project Location (Nearest Cross-street)	Project Status	Project Planner	Map Location
	UNDER CONSTRUCTION:								
PL15466 - UP, RT, DR	Veranda Shopping Center	CenterCal Properties Attn: Jeff Hill 1600 East Frankling Avenue El Segundo CA 90245 (310) 563-6900	375,000	30.00	126-440-001	2001-2003 Diamond Blvd (Galaxy Way & Willow Way) (S)	- As Built Plans Under Review	Frank Abejo (925) 671-3128	A
		Subtotal:	375,000						
	APPROVED:								
PL17535 - UP, DR	ARCO Gasoline Station and BP/ARCO AM/PM Convenience Store	Barghausen Consulting Engineers, Inc. Attn: Ed Hale 3883 Ruffin Rd, Ste. B San Diego, CA 92123 (425) 656-7443	3,245	0.94	110-130-033	Arnold Industrial Place and the Highway 4 Off Ramp East of Solano Way (N)	- Approved by PC 8/15/18 - Expires 8/28/19	Ryan Lenhardt (925) 671-3162	T
PL17350 - DR	Concord Chevrolet	Concord Chevrolet Attn: Tom Young 1330 Concord Avenue Concord, CA 94520 (925) 682-6400	15,864	1.14	126-291-021	1880 Market Street (Clayton Road) (S)	- Approved by DRB 6/14/18	Ryan Lenhardt (925) 671-3162	D
		Subtotal:	19,109						
	PROPOSED								
PL16221 - UP, DR	Chevron	Faizan Corporation 390 E Gobbi Street Ukiah, CA 95482 (510) 862-3333	1,999	0.41	113-288-005	2799 Clayton Road (The Alameda) (N)	- Deemed Incomplete	Lorna Villa (925) 671-3176	F
		Subtotal:	1,999						

Retail/Service Commercial Development	
Under Construction	375,000
Approved	19,109
Proposed	1,999
City Total:	396,108

CITY OF CONCORD
OFFICE/MEDICAL/INDUSTRIAL/PUBLIC DEVELOPMENT

Application Number(s)	Project Name	Applicant	Building Square Footage	Gross Parcel Acreage	Assessor's Parcel Number(s)	Project Location (Nearest Cross-street)	Project Status	Project Planner	Map Location
	UNDER CONSTRUCTION:								
PL18196 - UP, DR	Carondelet High School STEM Innovation Center	Ratcliff Attn: Dan Wetherell 5856 Doyle Street Emeryville, CA 94608 (510) 899-6400	17,700	9.18	145-130-024	1133 Winton Drive (Treat Blvd) (S)	- Approved by PC 7/18/18 - Expires 7/31/20	Ryan Lenhardt (925) 671-3162	E
PL15426 - UP, DR, RT	Shiva Temple	Ravi Nadesan 1803 2nd Street Concord, CA 94519 (925) 827-0127	56,154	0.73	113-011-008, -010, -016, -017	1803 2nd Street (Concord Boulevard) (N)	- Approved by PC 9/21/16 - Expires 10/4/17	Ryan Lenhardt (925) 671-3162	H
		Subtotal:	73,854						
	APPROVED:								
PL16510 - DR	North Point V	Concord Industrial Park, LP 4080 Port Chicago Highway Concord, CA 94520 (925) 827-0127	46,000	2.74	159-040-081	5177 Commercial Circle (Bates Avenue) (N)	- Approved by DRB 9/14/17 - Expires 11/2/18	Sarah Yuwiler (925) 671-3465	J
		Subtotal:	46,000						
	PROPOSED:								
		Subtotal:							

Office/Medical/Industrial/Public Development	
Under Construction	73,854
Approved	46,000
Proposed	0

CITY OF CONCORD
RESIDENTIAL DEVELOPMENT

Application Number(s)	Project Name	Applicant	Number of Units	Building Permits Issued	Gross Parcel Acreage	Assessor's Parcel Number(s)	Project Location (Nearest Cross-street)	Project Status	Project Planner	Map Location
	UNDER CONSTRUCTION:									
UA 12-005; DR 12-028	Renaissance	Legacy Partners 4000 East Third Ave, Suite 600 Foster City, CA 94404 (858) 626-8841	179 m.f.	179	2.75	126-062-013, -014	1825 Galindo Street (Willow Pass Rd.) (N)	- Building permits Issued 11/04/16 - Rebuild Required Due to Fire	Frank Abejo (925) 671-3128	V
UP 08-003; TM 08-002; V 08-001; DR 08-004	Oak Terrace (Poetry Gardens) Townhomes	Discovery Builders, Inc. Attn: Monte Davis 4061 Port Chicago Hwy., Ste. H Concord, CA 94520 (925) 682-6419	28 m.f.	20	1.44	126-210-045	1250 Detroit Avenue (Walters Way) (S)	-Last Phase completed and for sale subdivision acceptance planned for 1/8/19	Joan Ryan (925) 671-3370	K
		Subtotal:	0 Single Family	0 Single Family						
			207 Multiple Family	199 Multiple Family						

**CITY OF CONCORD
RESIDENTIAL DEVELOPMENT**

<i>Application Number(s)</i>	<i>Project Name</i>	<i>Applicant</i>	<i>Number of Units</i>	<i>Gross Parcel Acreage</i>	<i>Assessor's Parcel Number(s)</i>	<i>Project Location (Nearest Cross-street)</i>	<i>Project Status</i>	<i>Project Planner</i>	<i>Map Location</i>
		APPROVED:							
PL16333 - UP, DR	The Argent	Argent Concord LLC Attn: David Jones 121 7th Avenue Santa Cruz, CA 95062 (650) 318-8411	181 m.f.	1.57	126-082-008	2400 Willow Pass Road (Port Chicago Hwy & East St) (N)	- PC Approved 12/15/16 - Expires 6/17/19	Lorna Villa (925) 671-3176	O
PL18147 - PM, DR, AA	Berrywood	West Coast Land and Development, Inc. Attn: Jared West 145 John Glenn Drive Concord, CA 94520 (925) 332-8886	4 s.f.	1.06	116-030-008	Southwest of Berrywood Drive (Olive Drive) (V)	- Approved by ZA 9/5/18 - Appealed - Appeal denied by CC 10/17/18	Jessica Gonzalez (925) 603-5821	N
PL18132 - PM, DR	Chalomar Villas	Jim Georgantes 975 Ygnacio Valley Road Walnut Creek, CA 94596 (925) 589-1155	3 s.f.	0.50	129-152-004	2226 Chalomar Road (Notre Dame Dr) (S)	- Approved by ZA 9/5/18 - Expires 9/15/20	Sarah Yuwiler (925) 671-3465	W
PL15438 - UP, DR	Concord Village	Nicholson Development Properties Attn: Brent Nicholson 720 North 10th Street, A-128 Renton, WA 98057 (206) 979-9681	230 m.f.	2.30	126-083-011, -012, -013	2400 Salvio Street (Willow Pass Road) (N)	- Approved by PC 3/15/18 - Valid until 3/27/19 pending extension	Ryan Lenhardt (925) 671-3162	L
UP 08-009; TM 08-004; VA 08-012; RT 08-005; DR 08-024	Enclave Townhomes	Discovery Builders, Inc. Attn: Monte Davis 4061 Port Chicago Hwy., Ste. H Concord, CA 94520 (925) 682-6419	26 m.f.	1.17	113-041-007, -023	3000 Willow Pass Road (Parkside Drive) (N)	- Approved by PC 8/5/09; Final Map Approved* Spring 19 Construction Anticipated	Joan Ryan (925) 671-3370	S
PL18160 - UP, MUP, DR	Grant Street Mixed-Use Development	Hines Attn: Jeff Bean 101 California St, Ste 1000 San Francisco, CA 94111 (206) 839-8429	228 m.f. & 4,600 Sq. Ft. Commercial	1.95	126-093-001, -002, - 011, -017, -018, 126- 103-001, and -015-017	2211 Clayton Rd 2204, 2228, and 2292 Concord Blvd 1638, 1654, 1672, 1680, and 1738 Grant St (N)	- Approved by PC 9/19/18 - Expires 10/2/20	Ryan Lenhardt (925) 671-3162	G
PM 06-011; MS 411-06; VA 07-006	Hidden Corners	RAJPAL, Inc. Attn: Gursharnjeet Cheema 2712 Cowell Road Concord, CA 94518 (925) 864-9121	4 s.f.	0.63	126-182-051	2724 Cowell Road (San Miguel Road) (V)	- Approved by ZA 8/07/07 - Map recorded 4/28/17	Ryan Lenhardt (925) 671-3162	C
PL14123 - PM	Minor Subdivision @ 1840 Lynwood Drive	Robert L. Wheat 638 Enos Way #B Livermore, CA 94551 (925) 328-1079	3 s.f.	1.02	114-641-001	1840 Lynwood Drive (V)	- PC Approved 5/11/16 Valid until 5/11/20	Joan Ryan (925) 671-3370	Z
PL18267 - UP, DR	Salmon Run Apartments	Salmon Run, LLC Attn: David Jones 121 7th Avenue Santa Cruz, CA 95062 (650) 318-8411	32 m.f.	0.49	126-104-008	2325 Clayton Road (East St) (N)	- Approved by PC 11/7/18 - Valid to 11/19/20	Sarah Yuwiler (925) 671-3465	R
PL17231 - TM, RT, DR	Walnut Grove Major Subdivision	West Coast Land and Development, Inc. Attn: Jared West 145 John Glenn Drive Concord, CA 94520 (925) 332-8886	8 s.f.	1.85	147-251-009	985 Mohr Lane (Wicket Court) (S)	- Planning Commission Approved 12/20/17 - Valid to 1/3/19	Ryan Lenhardt (925) 671-3162	B
Subtotal:			22 Single Family						
			697 Multiple Family						

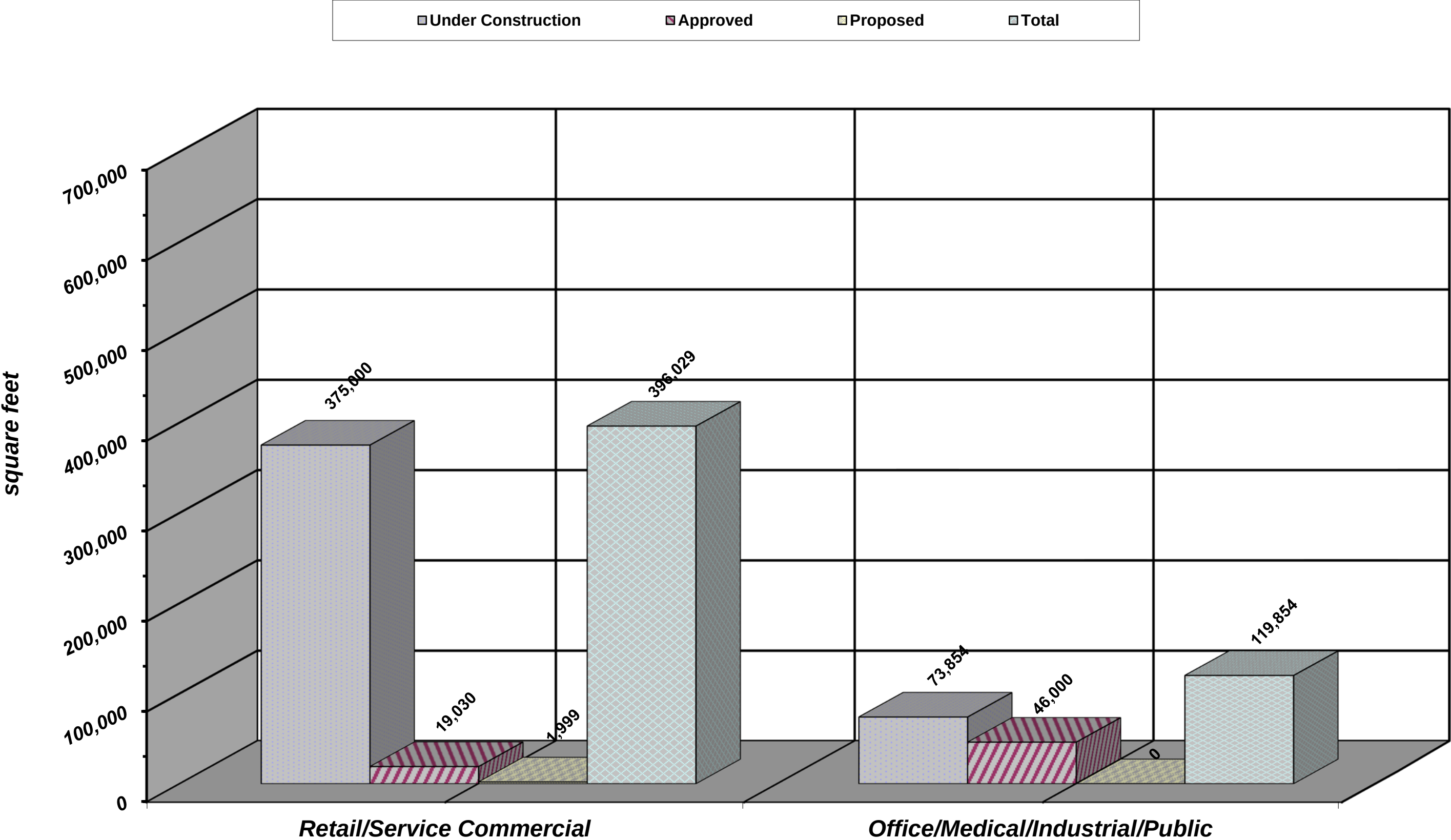
* Dates for Tentative Maps include automatic extensions provided by the Subdivision Map Act Sec. 66452.21 & Sec. 66452.22

CITY OF CONCORD
RESIDENTIAL DEVELOPMENT

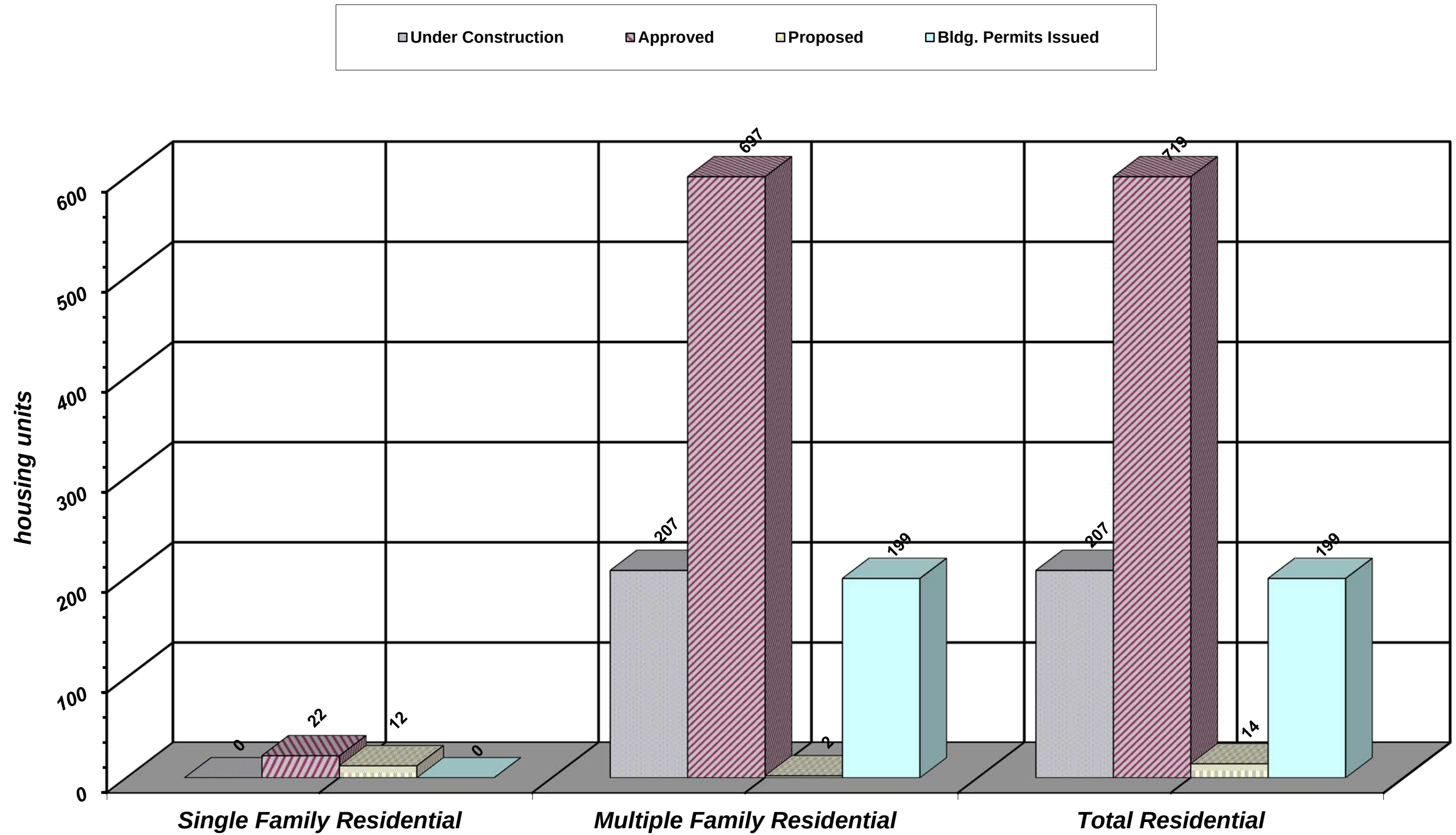
Application Number(s)	Project Name	Applicant	Number of Units	Gross Parcel Acreage	Assessor's Parcel Number(s)	Project Location (Nearest Cross-street)	Project Status	Project Planner	Map Location
	PROPOSED:								
PL18389 - DR	Davis Duplex	Steve Forster 1499 Davis Avenue Concord, CA 94518 (925) 677-2160	2 m.f.	0.18	105-064-020	1499 Davis Avenue (Clayton Rd) (V)	- Under Review	Jessica Gonzalez (925) 603-5821	X
UP 05-012; TM 05-011; RT 06-002; DR 04-023	Villa De La Vista (Tentative Map and Use Permit Amendment)	Discovery Builders, Inc. 4061 Port Chicago Hwy., Ste. H Concord, CA 94520 (925) 682-6419	12 s.f.	0.85	132-020-035	1491 La Vista Ave (Clayton Rd) (V)	- Pending PC Review	Frank Abejo (925) 671-3128	I
		Subtotal:	12 Single Family 2 Multiple Family						

	Single Family	Multiple Family
Under Construction	0	207
Approved	22	697
Proposed	12	2
City Total:	34	906
Building Permits Issued	8	199

CITY OF CONCORD Current Projects Report



CITY OF CONCORD Current Projects Report

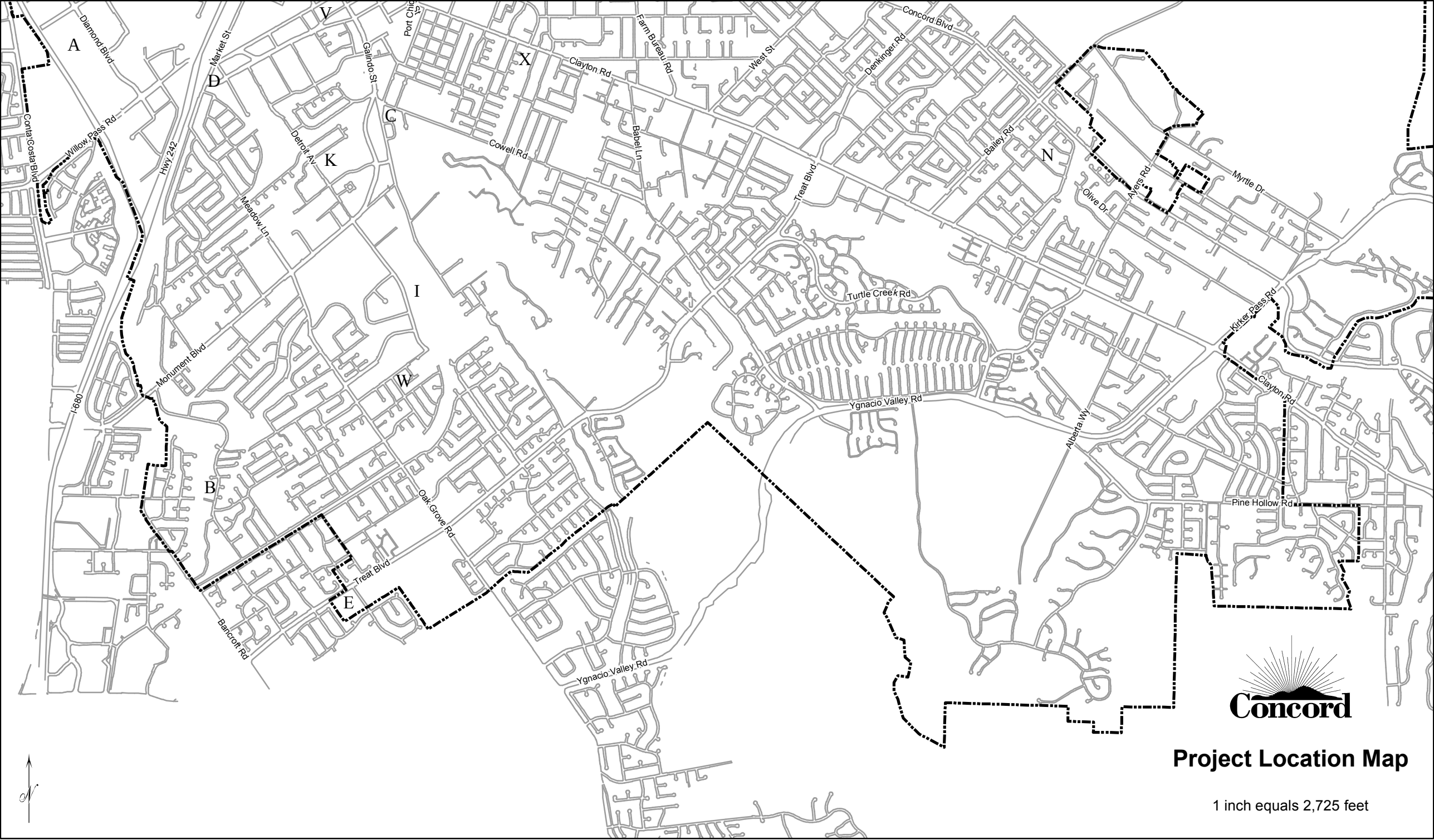




Project Location Map

1 inch equals 2,725 feet





Project Location Map

1 inch equals 2,725 feet

CITY OF WALNUT CREEK
PROJECT PIPELINE LIST - QUARTERLY REPORT
PROJECT STATUS AS OF DECEMBER 31, 2018

Project Pipeline List can be found on the City's website: <http://www.walnut-creek.org>
(click *Quick Links-Current Projects* on the home page)

UNDER CONSTRUCTION - <u>RESIDENTIAL</u>					
WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y12-066	Vaya (formerly The Landing) Apartments 207-235 Ygnacio Valley Road & 1778-1830 Lacassie Avenue Blake/Griggs Properties 800-285-2545	1.78	178 market-rate apartments (4 stories over 2 levels of parking w/185 stalls) (166 net new units)	Griffin	174-220-049, -050
Y13-101	Stoneyridge Lane Condominiums 110-151 Stoney Ridge Place, 1740 San Miguel Drive, and 215 Sierra Drive Peter Stackpole, LCA Architects 925-944-1626	1.14	21 new townhouse condominiums (6 net new units)	Kapovich	178-270-007; -008; -010; -022; -034; - 040; -041; -049
Y15-099	Stoneyhill Townhomes 1247 Walker Ave. and 203 Sierra Dr. Peter Stackpole, LCA Architects 925-944-1626	0.78	Nine new multifamily condominium units in three triplex buildings (5 net new units)	Kapovich	178-270-018 178-270-033
Y12-034	San Luis Subdivision 1850 San Luis Road Gregory Gorescnik 510-386-2004	0.70	Three lot subdivision with access from San Luis Road and Lynvale Lane. (3 net new units) (2 of 3 houses complete)	Griffin	171-240-034

UNDER CONSTRUCTION - RESIDENTIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y14-099	Riviera Apartments (Affordable) 1515 Riviera Avenue Resources for Community Development Alicia Klein 415-441-0789	0.34	A new 5-story structure with 30 affordable apartment units (studio, one, two and three bedroom units) and 21 parking spaces (30 net new units)	Carreon	174-150-067
Y14-100	Riviera Apartments (Affordable) 1738 Riviera Avenue Resources for Community Development Alicia Klein 415-441-0789	0.43	A new 5-story structure with 28 affordable apartment units (studio, one- and three-bedroom units) and 29 parking spaces (24 net new units)	Carreon	174-140-019
Y15-131	Riviera Avenue Condos 1605 Riviera Ave Peter Stackpole, LCA Architects 925-944-1626	0.50	48 condo units w/i a 5-story building. Four levels of residential units over two levels of parking. (38 net new units)	Croffoot	174-150-027
Y14-007	Trellis Residential Subdivision Hunt, Hale and Jones Architects Camp and Camp, Landscape Architects Nick Kosla, Pulte Homes Inc. 925-249-4318	5.23	Demolition of existing buildings to construct 52 two-story detached single-family homes on a 5.23 acre area, which is part of a 8.13-acre site formerly occupied by the Jewish Community Center (52 net new units)	Carreon	189-130-047

UNDER CONSTRUCTION - RESIDENTIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y16-127	Quail Run Townhome Condominiums 2480 Westcliffe Ln Debbie Ayres, Owner 925-872-5092	0.27	Demolition of an existing single family home and construction of a four-unit, two-story residential project on a 11,960 square-foot lot (3 net new units)	Carreon	173-030-001
Y15-146	St. Paul's Commons Apartments 1860 Trinity Avenue Alicia Klein, Resources for Community Development 510-841-4410 x336 aklein@rcdhousing.com	0.64	Demo all existing buildings for construction of a mixed use, four-story, 45-unit building for low income residents. Project includes an approximately 7,000 sq. ft. ground floor Church community center (45 net new units)	Carreon	178-091-010
Y15-083	Analisa Townhomes 10 Analisa Lane Dave Dacus, The Address Company 925-272-4750 x101 Ddacus@theaddress.com	1.01	Demolish 3 homes for construction of 11 townhomes (8 net new units)	Kapovich	180-010-016

UNDER CONSTRUCTION - RESIDENTIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y16-061	1716 Lofts (Mixed Use) 1716 North Main St. David Bogstad, LCA Architects 925-944-1626 david@lca-architects.com	0.91	Construction of a 5-story structure to accommodate 2,900 sf of ground floor retail, 48 market rate apartment units and parking for the building and the adjacent Rockcliffe Realty building (48 net new units)	Griffin	178-310-013, 178-310-014, 178-310-015 (partial)
Y15-029	Trinity Condos 1950, 1962 Trinity Avenue Rick Rosenbaum, Lenox Homes 925-283-8470	0.28	Three-story, 12-unit condominium building over parking garage (11 net new units)	Griffin	178-071-005 178-071-003
Y13-083	Fifteen24 Residential 1524 Oakland Blvd Ed Novak, Architect, 714-323-8396 Reza Fakurnejad, Owner, 925-788-4028	0.29	Six-unit condominium multifamily development. (4 net new units)	Carreon	178-010-036
Y14-066	1380 N. California (Mixed Use) 1380 N. California Blvd. Steve Perry, Brand & Allen Architects 415-441-0789 David Balducci, Align Real Estate	0.67	A new 6-story mixed use building consisting of 70 apartment units , 20 hotel rooms above ground level retail (16,323 sf) and a 3-level basement garage	Griffin	178-160-028

UNDER CONSTRUCTION - COMMERCIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y13-109	W.C. BART Transit Village PHASE 1 200 Ygnacio Valley Road Frank Arthur, WCLTA 510-816-5914	16.2 (total)	Five-level 900 stall parking garage, a 15 bay bus terminal and 1,500 square foot ground level BPD office for the circulation of pedestrians, bicycles, automobiles, and busses over the 3.01 acre site	Griffin	174-180-001 174-180-037

UNDER CONSTRUCTION - COMMERCIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y14-116 & Y15-130	Diablo Subaru Remodel & Building Addition 2646 & 2630 North Main Street Matthew Small, Architect Kistler, Small, & White Architects 541-488-8200 matt@kistlersmallwhite.com	0.94	Remodel existing auto dealership and customer service areas and add approximately 3,700 sq. ft. Project also includes a three-level, 155-space vehicle inventory and parking structure	Carreon	171-201-034, -035
Y13-066	Walnut Creek Ford Remodel and Addition 1800 N. Main St. (Dealership) 1400 Carlback Ave. (Service) Stephanie Malone 925-932-2900 hilltopgm@aol.com	3.5	Remodel and addition of dealership building adding 6,199 sf for a new total of 88,240 sf. Remodel of service building with landscaping and lot reconstruction on both sites	Griffin	178-320-002 178-320-013 178-320-014 178-320-021 178-340-014
Y15-170	Ultimate Fieldhouse Expansion 2640 Shadelands Drive Reed Onate, Hall Equities Group 925-933-4000	12.49	Expansion of the indoor recreation use in the former Contra Costa Times Building in the Shadelands Business Park	Griffin	143-040-031
Y14-151	Rossmoor Shopping Center Expansion & Remodel 1900-1998 Tice Valley Blvd. Dwight Belden, TKH Citi Rossmoor LLC 949-705-0405	15.23	Remodel and expansion of the (Safeway) shopping center with four new building pads (including CVS) and three drive-thrus and minor expansions of existing buildings totaling ~28,900 square feet. New parking lot circulation, layouts, and pedestrian paths	Carreon	189-040-006 through -013 and -046 through -049

UNDER CONSTRUCTION - COMMERCIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y15-036	Marriott Residence Inn 2050 N. California Rick Mielbye, DLR Group 913-897-7811 rmielbye@fpg-corp.com	1.1	Demo (e) bank building and auto sales lot for construction of 6-story, 160-room hotel w/ bi-level underground parking garage	Griffin	174-172-010 and -011
Y17-045	Walnut Creek Depot Building (formerly Vic Stewart's Restaurant) 850 S. Broadway Jonathan James, William Wood Architects 925-820-8233	0.67	Remodel and expansion of existing building from 6,936 square feet to 8,349 SF. Project will convert single restaurant space to five retail tenant spaces. New parking, circulation, and trash enclosure.	Arce	183-270-052

UNDER CONSTRUCTION - COMMERCIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y14-066	1380 N. California (Mixed Use) 1380 N. California Blvd. Steve Perry, Brand & Allen Architects 415-441-0789 David Balducci, Align Real Estate 415-770-1153	0.67	A new 6-story mixed use building consisting of 70 apartment units, 20 hotel rooms above ground level retail (16,323 sf) and a 3-level basement garage	Griffin	178-160-028
Y16-061	1716 Lofts (Mixed Use) 1716 North Main St. David Bogstad, LCA Architects 925-944-1626 david@lca-architects.com	0.91	Construction of five story structure to accommodate 2,900 sf of ground floor retail , 48 market rate apartment units and parking for the building and the adjacent Rockcliff Realty building (48 net new units)	Griffin	178-310-013, 178-310-014, 178-310-015 (partial)

UNDER CONSTRUCTION – COMMUNITY FACILITIES

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y15-183	Ruth Bancroft Garden Community Building Veronika Rathert, Canyon Design Building 510-482-0300	11.9	Construction of a two-story community building, approximately 7,000 sq. ft. and phase II of RBG Master Plan	Carreon	143-030-029, 030
Y15-123	Viamonte Senior Housing/ Residential Care Facility 2801 Shadelands Drive Peter Lin, Greenbrier Development 214-979-2715	3.8	Construction of a 191-unit, four-story senior housing and residential care facility for the elderly with a 204-space underground parking garage.	Croffoot	143-040-086, -087, -088

CITY OF WALNUT CREEK
PROJECT PIPELINE LIST - QUARTERLY REPORT
PROJECT STATUS AS OF DECEMBER 31, 2018

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(click *Quick Links-Current Projects* on the home page)

APPROVED – <u>RESIDENTIAL</u>					
WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y05-027	W.C. BART Transit Village (Mixed Use) 200 Ygnacio Valley Road Frank Arthur, WCLTA 510-816-5914	16.2	596 residential apt units , 30,000 sq. ft. commercial, (Phases 2 and 3) parking garage for 1,500 vehicles (Phase 1) (596 net new units)	Griffin	174-180-001 174-180-037
Y06-003	Lincoln Avenue Triplex 1229 Lincoln Avenue Gary Balsdon 925-989-4004	0.16	New 3 unit condo development (2 net new units)	Griffin	178-261-002
Y16-169	Fuetsch Multi-family Development 2360 Buena Vista Avenue Joshua Larson, Larson Shores Architecture + Interiors 510-444-9788 josh@larsonshores.com	0.32	Four-unit condo development (3 net new units)	Croffoot	174-031-022

APPROVED – RESIDENTIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y16-051	TRG Bayrock Apartments (former Le Virage) 2211 North Main St. Stuart Gruendl The Richmond Group of California 510-969-2323 stuart@bay-rock.com	0.44	52 market rate apartment units over parking (52 net new units)	Griffin	174-150-044
Y08-042	Parkview Condos 1665 Carmel Drive David Bogstad, LCA Architects 925-944-1626 david@lca-architects.com	0.27	5-story, 8-unit condominium project with 12 parking stalls (7 net new units)	Gill	178-290-008

APPROVED – RESIDENTIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y16-131	2640 Jones Road Apartments 2640 Jones Road Chris Trent, Dahlin Group 925-250-1942	0.33	Demo an existing duplex building for construction of a three-story, six-unit apartment building (5 net new units)	Kapovich	172-140-028
Y16-066	1072 YVR (Zandi) Lofts 1072 Ygnacio Valley Road Janice Yeh, Adaptive Architecture 408-865-1089 Janice@adaptivearch.us	0.28	Demolish (e) single family home and construct a five-unit, three-story residential project on a 12,100 square foot lot (4 net new units)	Croffoot	173-172-021
Y17-079	Habitat for Humanity – Las Juntas 1250 Las Juntas Way Hamid Taeb, Habitat for Humanity EBSV 510-803-3355 htaeb@HabitatEBSV.org	2.05	Development of a 42-unit multifamily residential project on a vacant 2.05-acre site formerly the site of the Las Juntas Swim Club. Density bonus request per State law & City ordinance (42 net new units)	Carreon	148-180-050, -051, -052
Y17-156	Bay Area Home Builders Subdivision No. 9472 1728 San Luis Road Atri Macherla, BAHB Inc. 417-350-5853	1.68	A six-lot, single-family residential subdivision on a 1.68-acre lot (5 net new units)	Carreon	171-230-042

APPROVED – RESIDENTIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y15-108	Secluded Woods Subdivision 1835 Weaver Lane Jim Parsons, Engineer, PA Design Resources 925-210-9300	1.96	A seven-lot, single-family residential subdivision. Project will preserve two historic structures (6 net new units)	Carreon	145-042-012
Y17-182	WCTV Phase 2 Redesign 200 Ygnacio Valley Rd. Blake Griggs Properties Brad Griggs 925-575-8737	4.19	Redesign of the Transit Village Phase 2 which include buildings two and three containing both <u>residential</u> and commercial components. Revisions include architectural style, colors, materials and amenity locations of the buildings and landscape enhancements	Griffin	174-190-038
Y18-012	1910 NoMa 1910 N. Main Street (Fuddruckers) Blake Griggs Properties Brad Griggs 925-575-8737	0.97	Six and seven-story, mixed-use building consisting of 135 residential units and approximately 10,000 square feet of commercial space on the ground floor	Kapovich	178-411-017

APPROVED – COMMERCIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y05-027	W.C. BART Transit Village (Mixed Use) 200 Ygnacio Valley Road Frank Arthur, WCTLA 510-816-5914	16.2	596 residential apt units, 20,000 sq. ft. commercial (Phases 2 & 3), parking garage for 1,500 vehicles (Phase 1)	Griffin	174-180-001 174-180-037
Y16-041	Grower's Square Exterior Remodel 1646, 1656, 1676 N. California Boulevard Paul Ferro, Form4 Architecture 415-775-8748	2.65	Renovation of existing office complex including new color and material palette, new landscaping and site improvements, a redesign of the pedestrian circulation and plaza spaces, and removal of 30 trees	Croffoot	178-192-016
Y16-112	The Foundry Marketplace 1250 Locust Street Brian Hirahara, BH Development 925-935-6800 Brian@bhdev.com	1.32	Construction of a new single-story, 23,129 square-foot food hall with two accessory courtyard buildings and a large outdoor courtyard area.	Croffoot	184-060-013, 018
Y15-085	F&M Bank 1823 & 1871 North Main Street Grover Wilson III, F&M Bank 209-367-2362	0.57	Demolition of the vacant Target Garden Center and construction of a new 5,700 square foot freestanding bank with drive up ATM and customer parking lot	Croffoot	174-230-008, 011
Y15-049	Nissan Autocom 1840 N Main Street Christy Newport, Chatfield Construction 209-333-1818 cnewport@chatfieldconstruction.com	1.4	A project to demolish an existing small sales building and construct a new 10,494 square foot showroom and covered service lanes	Croffoot	178-330-001, 004

Y16-119	Bali Construction Offices Remodel/Addition 2600 North Main Street Ahmad Mohazab, Tecta Associates 415-362-5851	0.20	A remodel/addition to an existing 1,344 square foot building. Project will use pre-manufactured shipping containers for a new total floor area of 2,463 SF	Arce	171-201-031
Y17-083	Volvo Cars of Walnut Creek 2755, 2771, & 2791 North Main St. Jeff Qvale, Qvale Management Galen Grant, Architect -FCGA Architecture 925-678-2030	2.71	Demolish all existing buildings for new showroom, service, administrative facilities, and separate detail/carwash building totaling approximately 30,400 sq. ft.	Carreon	171-062-054, -055, -056, and -057
Y17-182	WCTV Phase 2 Redesign 200 Ygnacio Valley Rd. Blake Griggs Properties Brad Griggs 925-575-8737	4.19	Redesign of the Transit Village Phase 2 which include buildings two and three containing both residential and commercial components. Revisions include architectural style, colors, materials and amenity locations of the buildings and landscape enhancements	Griffin	174-190-038
Y17-132	Hilton Garden Inn 490 Lawrence Way Tharaldson Hospitality Development Don Cape 702-385-4988	2.26	New three-story, 124 room hotel with parking and pool area. Project requires a Rezone from AS to PD and Design Review. Project also requires an MND for CEQA compliance	Griffin	173-121-046 173-121-047
Y18-012	1910 Noma 1910 N. Main Street (Fuddruckers) Brad Griggs, Blake Griggs Properties 925-575-8737	0.97	Six to seven-story, mixed-use building consisting of 135 residential units and approximately 10,000 square feet of commercial space on the ground floor	Kapovich	178-411-017

Y17-154	Lifetime Athletic (Broadway Plaza Long-Range Master Plan Phase 2B) 1315 Broadway Plaza Garrett Newland, Macerich Northwestern Assoc. 602-953-6582	1.15	New two-story, 50-foot tall, 75,000 square-foot health club (w/ basement and roof deck pool), at the Building 7 site within Broadway Plaza. Also, a CUP to allow a health club use in the P-D zoning district	Kapovich	183-011-024
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APPROVED – COMMUNITY FACILITIES

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y16-010	Tiffany Court Memory Care Building 1866 and 1872 San Miguel Dr. Douglas Pancake - Architect 949-720-3850	0.71	A proposal to add a new 24-bed Memory Care facility to an existing residential care facility	Gill	180-020-058, 008 & 009
Y16-052	Byron Park Expansion 1700 Tice Valley Blvd Kevin Shirata, KSL BP Holdings 760-804-5900 Kevin.shirata@kiscosl.com	1.22	Construction of a two-story, 40 bed, 33,649 square-foot residential care facility with underground parking on a vacant lot	Kapovich	189-040-016
Y15-152	59-Bed Skilled Nursing Facility 2640 Shadelands Drive Reed Onate, Hall Equities Group 925-933-4000	3.0	59-bed skilled nursing facility on a site currently developed with a 6,000-s.f. metal shed.	Griffin	Portions of 143-040-031 and 143-040-050 (to be reassessed)

APPROVED – COMMUNITY FACILITIES

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y17-106	Tony La Russa's Animal Rescue Foundation (ARF) Expansion/Remodel 2890 Mitchell Drive JPA Strategies Group, Inc - John Parezo 818-620-3790	8.64	A 5,640 square foot addition to the existing Animal Rescue Foundation and Construction of a new two-story, 7,005 square foot Veteran's Services Building	Gill	143-040-104

UNDER REVIEW – RESIDENTIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	NUMBER AND TYPE OF UNITS	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
>	Carmel Drive Townhomes 1487, 1493, and 1500 Carmel Drive	>	17-unit multi-family residential project consisting of 14 condominiums and 3 apartment units (11 net new units)	Croffoot	>
Y17-156	BAHB/The Address Co. Subd. SFR Designs 1728 San Luis Road Eric Chevalier, The Address Company 925-272-4750 x102	1.68	The proposed SFR designs and landscaping plans for the previously approved six-lot residential subdivision on a 1.68-acre lot (5 net new units)	Carreon	171-230-042
Y18-063	1532 Mt. Diablo Mixed-Use Building 1532 Mt. Diablo Blvd. Align Real Estate Jessie Stuart 415-370-1767	0.41	A Design Review to construct a four- story mixed-use building consisting of 9,500 square feet of ground floor commercial space, 30 condo units on floors 2-4, an activated rooftop deck, and two levels of below grade parking (30 net new units)	Kapovich	178-230-029
Y18-013	Pioneer Village Townhomes 128, 148, & 158 Pioneer Avenue Phil Volkmann, Volkmann Architecture (925)478-2998 Aaron Vitale, Vitale Building & Enterprises 510-215-7400	1.37	A 19-unit multifamily townhome development on 1.37 acres. The project consists of both single detached units and attached duets, served by a private internal drive aisle. (16 net new units)	Carreon	171-061-007, -008, & -009

UNDER REVIEW - COMMERCIAL

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y18-006	Toyota Service Center 2150 N. Broadway Peter Stackpole, LCA Architects 925-944-1626 pstackpole@lca-architects.com	1.4	GPA, Rezone, DR to build a multi-level vehicle service senter to pair with the dealership located south of the project site. Proposed project exceeds FAR allowed by the General Plan.	Griffin	173-134-003
Y18-063	1532 Mt. Diablo Mixed-Use Building 1532 Mt. Diablo Blvd. Align Real Estate Jessie Stuart 415-370-1767	0.41	A Design Review to construct a four-story mixed-use building consisting of 9,500 square feet of ground floor commercial space , 30 condo units on floors 2-4, an activated rooftop deck, and two levels of below grade parking (30 net new units)	Kapovich	178-230-029
Y18-064	Smile Power Orthodontics 1000 Ygnacio Valley Road Stephen Elbert, Elbert Associates 925-299-0111 se@elbertarchitecture.com	0.24	A Design Review application for an exterior site and building remodel to accommodate a new orthodontics office at 1000 Ygnacio Valley Road. The project also includes a 365 square foot addition.	Croffoot	174-172-027

UNDER REVIEW - COMMERCIAL

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UNDER REVIEW – COMMUNITY FACILITIES

WORK ORDER NUMBER	PROJECT NAME LOCATION CONTACT	SITE SIZE (in acres)	GROSS FLOOR AREA/USE	PROJECT PLANNER	ASSESSOR'S PARCEL NUMBER
Y18-119	Northcreek Church Phase 2 Addition 2303 Ygnacio Valley Rd Mike Branagh of Branagh Dev. Inc. 2800 Mt. Diablo Blvd, Suite 200 Lafayette, CA. 94549 925-743-9500	>	A new 47,510 sq. ft. building to accommodate a new gymnasium, classrooms, meeting space and auditorium. The project also includes site improvements to existing landscaping and parking	Caguiat	>

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