PUBLIC DRAFT
ENVIRONMENTAL IMPACT REPORT

FOR THE

2040 LAKE FOREST GENERAL PLAN

SCH# 2019090102

NOVEMBER 2019

Prepared for:

City of Lake Forest
Community Development Department
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Lake Forest, CA 92630

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De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

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PUBLIC DRAFT EIR

Chapter **Page Number**

Executive Summary ES-1

1.0 Introduction 1.0-1

1.1 Introduction 1.0-1

1.2 Purpose of the EIR 1.0-2

1.3 Type of EIR 1.0-3

1.4 Intended Uses of the EIR 1.0-4

1.5 Known Responsible and Trustee Agencies 1.0-4

1.6 Environmental Review Process 1.0-5

1.7 Organization and Scope 1.0-6

1.8 Comments Received on the Notice of Preparation 1.0-8

2.0 Project Description 2.0-1

2.1 Background and Overview 2.0-1

2.2 Project Location 2.0-5

2.3 Project Objectives 2.0-6

2.4 Description of Proposed General Plan Project 2.0-7

2.5 General Plan Buildout Analysis 2.0-15

2.6 Uses of the EIR and Required Agency Approvals 2.0-17

3.1 Aesthetics 3.1-1

3.1.1 Environmental Setting 3.1-3

3.1.2 Regulatory Setting 3.1-6

3.1.3 Impacts and Mitigation Measures 3.1-8

3.2 Agricultural and Forest Resources 3.2-1

3.2.1 Environmental Setting 3.2-1

3.2.2 Regulatory Setting 3.2-3

3.2.3 Impacts and Mitigation Measures 3.2-5

3.3 Air Quality 3.3-1

3.3.1 Existing Setting 3.3-1

3.3.2 Regulatory Setting....3.3-14
3.3.3 Impacts and Mitigation Measures....3.3-22
3.4 Biological Resources....3.4-1
3.4.1 Environmental Setting....3.4-2
3.4.2 Regulatory Setting....3.4-11
3.4.3 Impacts and Mitigation Measures....3.4-16
3.5 Cultural and Tribal Cultural Resources....3.5-1
3.5.1 Environmental Setting....3.5-1
3.5.2 Regulatory Setting....3.5-15
3.5.3 Impacts and Mitigation Measures....3.5-22
3.6 Geology....3.6-1
3.6.1 Environmental Setting....3.6-1
3.6.2 Regulatory Setting....3.6-14
3.6.3 Impacts and Mitigation Measures....3.6-17
3.7 Greenhouse Gas Emissions and Energy....3.7-1
3.7.1 Environmental Setting....3.7-1
3.7.2 Regulatory Setting....3.7-8
3.7.3 Impacts and Mitigation Measures....3.7-17
3.8 Hazards and Hazardous Materials....3.8-1
3.8.1 Environmental Setting....3.8-1
3.8.2 Regulatory Setting....3.8-8
3.8.3 Impacts and Mitigation Measures....3.8-15
3.9 Hydrology and Water Quality....3.9-1
3.9.1 Environmental Setting....3.9-1
3.9.2 Regulatory Setting....3.9-6
3.9.3 Impacts and Mitigation Measures....3.9-16
3.10 Land Use Planning and Population/Housing....3.10-1
3.10.1 Environmental Setting....3.10-1
3.10.2 Regulatory Setting....3.10-6
3.10.3 Impacts and Mitigation Measures....3.10-10

3.11 Mineral Resources 3.6-1
3.11.1 Environmental Setting 3.6-1
3.11.2 Regulatory Setting 3.6-2
3.11.3 Impacts and Mitigation Measures 3.6-3
3.12 Noise 3.11-1
3.12.1 Environmental Setting 3.11-1
3.12.2 Regulatory Setting 3.11-16
3.12.3 Impacts and Mitigation Measures 3.11-20
3.13 Public Services and Recreation 3.12-1
3.13.1 Existing Conditions 3.12-1
3.13.2 Regulatory Setting 3.12-9
3.13.3 Impacts and Mitigation Measures 3.12-13
3.14 Transportation 3.13-1
3.14.1 Transportation Setting 3.13-1
3.14.2 Regulatory Setting 3.13-11
3.14.3 Impacts and Mitigation Measures 3.13-18
3.15 Utilities and Services Systems 3.15-1
3.15.1 Water Supplies 3.15-1
3.15.2 Wastewater 3.15-14
3.15.3 Stormwater Drainage 3.15-24
3.15.4 Solid Waste 3.15-33
3.16 Wildfire 3.16-1
3.16.1 Environmental Setting 3.16-1
3.16.2 Regulatory Setting 3.16-3
3.16.3 Impacts and Mitigation Measures 3.16-7
4.0 Cumulative/Other CEQA-Required Topics 4.0-1
4.1 Cumulative Setting and Impact Analysis 4.0-1
4.2 Growth-Inducing Effects 4.0-25
4.3 Significant Irreversible Effects 4.0-27
4.4 Significant and Unavoidable Impacts 4.0-27
5.0 Alternatives 5.0-1

5.1 CEQA Requirements 5.0-1
5.2 Alternatives Considered in this EIR 5.0-1
5.3 Environmental Analysis 5.0-5

6.0 Report Preparers 6.0-1

7.0 References 7.0-1

Table **Page Number**

Table ES-1: Comparison of Alternatives to the Proposed Project ES-2
Table ES-2: Project Impacts and Proposed Mitigation Measures ES-4
Table 2.0-1: Land Use Designation Acreages 2.0-14
Table 2.0-2: Comparative Growth Projections, Current General Plan Land Use Map and Draft Land Use Map 2.0-15
Table 2.0-3: Planning Area Buildout Potential 2.0-16
Table 3.2-1: Farmland Types in Lake Forest 3.2-2
Table 3.3-1: Federal and State Ambient Air Quality Standards 3.3-11
Table 3.3-2: State and National Attainment Status (Orange County) 3.3-12
Table 3.3-3: Orange County Ambient Air Quality Monitoring Data Summary - Ozone 3.3-13
Table 3.3-4: Orange County Ambient Air Quality Monitoring Data Summary - $PM_{2.5}$ 3.3-13
Table 3.3-5: Orange County Ambient Air Quality Monitoring Data Summary - PM_{10} 3.3-13
Table 3.3-6: Maximum Regional Construction Emissions (pounds/day) 3.3-33
Table 3.3-7: Maximum Regional Operations Emissions (pounds/day) 3.3-33
Table 3.4-1: Cover Types- California Wildlife Habitat Relationship System 3.4-3
Table 3.4-2: Special Status Plants Present or Potentially Present 3.4-7
Table 3.4-3: Special Status Animals Present or Potentially Present 3.4-9
Table 3.5-1: Culture Change Chronology 3.5-2
Table 3.5-2: Previously Recorded Cultural Resources within the City of Lake Forest 3.5-9
Table 3.5-3: Additional Resources Consulted 3.5-13
Table 3.5-4: BLM General Land Office Records 3.5-14
Table 3.6-1: Richter Magnitudes and Effects 3.6-3
Table 3.6-2: Principal Historically Active and Active Faults in the Region 3.6-3
Table 3.6-3: Likelihood of Having One or More Earthquakes by Size in the Next 30 Years 3.6-4
Table 3.6-4: Modified Mercalli Intensities and Effects 3.6-5
Table 3.6-5: Liquefaction Potential Based on Sediment Type and Age of Deposit 3.6-8

Table 3.6-6: City of Lake Forest Soils 3.6-9
Table 3.7-1: Lake Forest Community GHG Inventory Emissions Sectors 3.7-20
Table 3.7-2: Lake Forest Community GHG Emissions Inventory – Baseline Year 2015 ..... 3.7-26
Table 3.7-3: Lake Forest Community GHG Emissions Inventory – Project Future Year 2030 ..... 3.7-26
Table 3.7-4: Lake Forest Community GHG Emissions Inventory – Project Future Year 2040 ..... 3.7-27
Table 3.7-5: Lake Forest Community GHG Emissions Inventory – Project Future Year 2050 ..... 3.7-27
Table 3.7-6: Lake Forest Community GHG Emissions Per Capita Emissions and Targets (MT CO_2e) 3.7-28
Table 3.7-7: Project Operational Natural Gas and Electricity Usage (Unmitigated Scenario) 3.7-33
Table 3.7-8: On-road Mobile Fuel Generated by Project Construction Activities – By Phase 3.7-34
Table 3.8-1: Lake Forest Site Cleanup and Hazardous Facilities List (Envirostor) 3.8-2
Table 3.8-2: Lake Forest Geotracker Database Sites 3.8-3
Table 3.8-3: Public Schools Serving Lake Forest 3.8-18
Table 3.9-1: State of California Watershed Hierarchy Naming Convention 3.9-2
Table 3.9-2: Projected Potable Water Demand vs. Supply (Acre-feet) 3.9-23
Table 3.10-1: Existing Land Uses 3.10-2
Table 3.10-2: City of Lake Forest Projects Under Review 3.10-4
Table 3.10-3: Population and Household Growth Trends 3.10-5
Table 3.10-4: Housing Supply, Mix, Growth, and Ownership, Lake Forest, Trade Area, and Orange County 3.10-6
Table 3.11-1: Mineral Resources Classification System 3.11-1
Table 3.12-1: Typical Noise Levels 3.12-3
Table 3.12-2: Reaction of People and Damage to Buildings for Continuous Vibration Levels 3.12-6
Table 3.12-3: Levels of Groundborne Vibration 3.12-7
Table 3.12-4: Predicted Existing Traffic Noise Levels 3.12-9
Table 3.12-5: Railroad Noise Measurement Results 3.12-11
Table 3.12-6: Approximate Distances to the Railroad Noise Contours 3.12-12
Table 3.12-7: Typical Stationary Source Noise Levels 3.12-13
Table 3.12-8: Existing Continuous 24-Hour Ambient Noise Monitoring Results 3.12-14

Table 3.12-9: Existing Short-Term Community Noise Monitoring Results 3.12-15
Table 3.12-10: Lake Forest Safety and Noise Element table SN-2: Interior and Exterior Noise Standards 3.12-18
Table 3.12-11: Lake Forest Safety and Noise Element table SN-3: Noise/Land Use Compatibility Matrix 3.12-19
Table 3.12-12: Significance of Changes in Noise Exposure 3.12-21
Table 3.12-13: Effects of Vibration on People and Buildings 3.12-22
Table 3.12-14: Vibration Source Levels for Construction Equipment 3.12-22
Table 3.12-15: 2040 Current and Proposed General Plan with 20-year Circulation System 3.12-24
Table 3.12-16: 2040 Current and Proposed General Plan with Buildout of Circulation System 3.12-27
Table 3.13-1: Fire Department Incident Type Report by Type 3.13-2
Table 3.13-2: Crimes by Category 3.13-5
Table 3.13-3: Public Schools Serving Lake Forest 3.13-8
Table 3.14-1: OCTA Transit Lines and Ridership (Fiscal Year 2016) 3.14-6
Table 3.14-2: Pedestrian Facility Conditions in Lake Forest 3.14-9
Table 3.14-3: Intersection LOS and V/C Ratios (ICU Methodology) 3.14-20
Table 3.14-4: Cumulative (2040) VMT Comparison 3.14-20
Table 3.14-5: Cumulative (2040) Plus Plan Intersection Level of Services (CMP Intersections) 3.14-21
Table 3.15-1: IWRD Projected Potable Water Demand Vs. Supply 3.15-4
Table 3.15-2: ETWD Projected Potable Water Demand Vs. Supply 3.15-5
Table 3.15-3: Net Gain in Key Demographic Values from BAU Current General Plan Buildout to Proposed General Plan Buildout 3.15-10
Table 3.15-4: Net Increase in Average Day Water Demand From BAU Current General Plan Buildout to Proposed 2040 General Plan Buildout 3.15-11
Table 3.15-5: Projected Sewer Flow vs. Treatment Capacity (Million Gallons Per Day, MGD) 3.15-17
Table 3.15-6: Net Increase in Wastewater ADF from BAU Current General Plan Buildout to Proposed 2040 General Plan Buildout 3.15-21
Table 3.15-7: Solid Waste Generation Rates in the City of Lake Forest 3.15-35
Table 4.0-1: Existing Land Uses in the Planning Area (2018) 4.0-3
Table 4.0-2: Comparative Growth Projections, Current General Plan Land Use Map and Draft Land Use Map 4.0-3
Table 4.0-3: Planning Area Buildout Potential 4.0-4

Table 4.0-4: Potential New Growth in Planning Area Over Current General Plan 4.0-5
Table 4.0-5: Cumulative (2040) VMT Comparison..... 4.0-18
Table 4.0-6: Cumulative (2040) Plus Plan Intersection Level of Service (CMP Intersections) 4.0-19
Table 4.0-7: Net Increase in Wastewater ADF from BAU Current General Plan Buildout to Proposed Plan Buildout 4.0-21
Table 5.0-1: Growth Projections by Alternative 5.0-4
Table 5.0-2: Alternative 1 v. Proposed General Plan Land Use Designations Comparison..... 5.0-6
Table 5.0-3: Alternative 2 v. Proposed General Plan Land Use Designations Comparison..... 5.0-9
Table 5.0-4: Alternative 3 v. Proposed General Plan Land Use Designations Comparison..... 5.0-19
Table 5.0-5: Comparison of Alternatives to the Proposed Project..... 5.0-29

Figures

Note: Figures are located at the end of the chapters.

Figure 2.0-1 Regional Location
Figure 2.0-2 Planning Boundaries
Figure 2.0-3 Land Use Map
Figure 3.2-1 Important Farmlands
Figure 3.4-1 Wildlife-Habitat Relationship Cover Types
Figure 3.4-2 CNDDB – 9-Quad Search
Figure 3.6-1 Local Earthquake Fault Zones
Figure 3.6-2 Liquefaction Seismic Hazards
Figure 3.6-3 Landslide Seismic Hazard Zones
Figure 3.6-4 NRCS Soil Map
Figure 3.6-5 Shrink-Swell Potential of Soils
Figure 3.6-6 Landslide Susceptibility
Figure 3.6-7 Paleontological Sensitivity
Figure 3.8-1 Fire Hazard Severity Zone
Figure 3.8-2 Fire threat
Figure 3.9-1 Hydrologic Units
Figure 3.9-2 Hydrologic Areas
Figure 3.9-3 FEMA Flood Insurance Rate Map
Figure 3.10-1 Planning Area

Figure 3.10-2 Existing Land Uses (SCAG)
Figure 3.10-3 Current General Plan
Figure 3.10-4 Planned Communities
Figure 3.13-1 Fire Stations
Figure 3.13-2 Parks
Figure 3.13-3 Riding and Hiking Trails
Figure 3.14-1 2008 Circulation Element Roadway Classifications
Figure 3.14-2 Existing Transit Facilites
Figure 3.14-3 Existing Bicycle/Pedestrian Facilites
Figure 3.14-4 Existing Freight Routes
Figure 3.14-5 Mobility Element Roadway Classifications
Figure 3.15-1 Municipal Water Districts
Figure 3.15-2 Water Utility Infrastructure
Figure 3.15-3 Sewer utility Infrastructure
Figure 5.0-1 Alternative 2 Reduced Mixed Growth
Figure 5.0-2 Alternative 3 High Density Residential

Appendices

Appendix A –Notice of Preparation and Comments Received Regarding the Notice of Preparation

Appendix B – Buildout Projection Calculations and Assumptions

Appendix C – Air Quality, Greenhouse Gas, and Energy Modeling

Appendix D – Paleontological and Cultural Resources Assessment

Appendix E – Noise Background Report

Appendix F – Transportation Impact Analysis

Appendix G – Background Report for Infrastructure Analysis

PURPOSE

The City of Lake Forest (City) as lead agency, determined that the 2040 Lake Forest General Plan project (2040 General Plan, General Plan, or project) is a "project" within the definition of the California Environmental Quality Act (CEQA), and requires the preparation of an Environmental Impact Report (EIR). This Draft EIR has been prepared to evaluate the environmental impacts associated with implementation of the project. This EIR is designed to fully inform decision-makers in the City, other responsible and trustee agencies, and the general public of the potential environmental consequences of approval and implementation of the General Plan. A detailed description of the proposed project, including the components and characteristics of the project, project objectives, and how the EIR will be used, is provided in Chapter 2.0 (Project Description).

AREAS OF CONTROVERSY AND ISSUES TO BE RESOLVED

This Draft EIR addresses environmental impacts associated with the project that are known to the City, raised during the Notice of Preparation (NOP) scoping process, or were raised during preparation of the Draft EIR. This Draft EIR addresses the potentially significant impacts associated with aesthetics, agriculture and forest resources, air quality, biological resources, cultural and tribal cultural resources, geology, greenhouse gas emissions and energy, hazards and hazardous materials, hydrology and water quality, land use planning and population/housing, mineral resources, noise, public services and recreation, transportation, utilities and service systems, wildfire, and cumulative impacts.

During the NOP process, four comment letters were received from interested agencies and organizations. The comments are summarized in Chapter 1.0 (Introduction), and are also provided in Appendix A.

ALTERNATIVES TO THE PROPOSED PROJECT

The CEQA Guidelines require an EIR to describe a reasonable range of alternatives to the project or to the location of the project which would reduce or avoid significant impacts, and which could feasibly accomplish the basic objectives of the proposed project. The alternatives analyzed in this EIR include the following:

- **Alternative 1: No Project Alternative**. Under Alternative 1, the City would not adopt the General Plan Update. The existing Lake Forest General Plan would continue to be implemented and no changes to the General Plan, including the Land Use Map, Circulation Diagram, goals, policies, or actions would occur. Subsequent projects, such as amending the Municipal Code (including the zoning map), would not occur. The existing General Plan Land Use Map is shown on Figure 3.10-3.
- **Alternative 2: Reduced Mixed Growth Alternative**. Alternative 2 continues to provide for a balance of job-creating and residential development land uses in mixed-use focus areas throughout the City, but at residential densities and nonresidential intensities lower than those reflected in the proposed General Plan. Figure 5.0-1 depicts the Land Use Map

proposed for Alternative 2. This alternative was developed to potentially reduce the severity of significant impacts associated with air quality, and hazards, as well as the potential further reduction in less than significant impacts related to aesthetics, and public services and utilities.

- **Alternative 3: High Density Residential Alternative**. Alternative 3 would revise the General Plan Land Use Map to place more emphasis on identifying specific areas for high density residential land uses, allowing for densities up to 43 du/ac, in mixed-use and non-mixed-use configurations, such as MU-43 and High Density Residential (HDR). Figure 5.0-2 depicts the Land Use Map proposed for Alternative 3. This alternative emphasizes high density residential development and de-emphasizes commercial development and business expansion, with the goal of achieving a jobs-housing balance closer to 1.0. This alternative was developed to potentially reduce the severity of less than significant impacts related to aesthetics, noise, public services and utilities.

A comparative analysis of the proposed project and each of the project alternatives is provided in Table ES-1 below. The table includes a numerical scoring system, which assigns a score of 1 to 5 to each of the alternatives with respect to how each alternative compares to the proposed project in terms of the severity of the environmental topics addressed in this EIR. A score of "3" indicates that the alternative would have the same level of impact when compared to the proposed project. A score of "1" indicates that the alternative would have a better (or reduced) impact when compared to the proposed project. A Score of "2" indicates that the alternative would have a slightly better (or slightly reduced) impact when compared to the proposed project. A score of "4" indicates that the alternative would have a slightly worse (or slightly increased) impact when compared to the proposed project. A score of "5" indicates that the alternative would have a worse (or increased) impact when compared to the proposed project. The project alternative with the lowest total score is considered the environmentally superior alternative.

TABLE ES-1: COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT

ENVIRONMENTAL ISSUE	*PROPOSED PROJECT*	*ALTERNATIVE 1 (NO PROJECT)*	*ALTERNATIVE 2 (MIXED)*	*ALTERNATIVE 3 (HDR)*
Aesthetics	3 Same	1 – Better	2 – Slightly Better	2 – Slightly Better
Agricultural Resources	3 – Same	3 – Same	3 – Same	3 - Same
Air Quality	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Biological Resources	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Cultural Resources	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Geology and Soils	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Greenhouse Gases, Climate Change, and Energy	3 – Same	5 – Worse	4 – Slightly Worse	4 – Slightly Worse
Hazards and Hazardous Materials	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Hydrology and Water Quality	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Land Use and Population	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Noise	3 – Same	1 – Better	2 – Slightly Better	2 – Slightly Better
Public Services and Recreation	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Transportation and Circulation	3 – Same	5 – Worse	4 – Slightly Worse	4 – Slightly Worse
Utilities	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Wildfire	3 – Same	3 – Same	3 – Same	3 – Same
Irreversible Effects	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
SUMMARY	**48**	**48**	**44**	**48**

As shown in Table ES-1, Alternative 2 (Reduced Mixed Growth Alternative) is the environmentally superior alternative when looked at in terms of all potential environmental impacts. While Alternative 3 has the same score as the Proposed General Plan, Alternative 3 fails to reduce the severity of any of the significant and unavoidable impacts of the proposed project and scores lower compared to Alternative 2. None of the alternatives reduce any significant and unavoidable impacts to a less than significant level. Throughout the preparation of the General Plan Update, the City Council, Planning Commission, and GPAC all expressed a desire and commitment to ensuring that the General Plan not only reflect the community's values and priorities, but also serve as a self-mitigating document and avoid significant environmental impacts to the greatest extent feasible. To that end, the proposed General Plan includes the fully range of feasible mitigation available to reduce potential impacts to the greatest extent possible.

Overall, Alternative 2 is the environmentally superior alternative as it is the most effective in terms of overall reduction of impacts compared to the proposed General Plan and all other alternatives. As such, Alternative 2 is the environmentally superior alternative for the purposes of this EIR analysis. Additionally, similar to the Proposed General Plan, Alternative 2 meets all project objectives. Like the proposed project, Alternative 2 reflects the current goals and vision expressed by city residents, businesses, decision-makers, and other stakeholders; addresses issues and concerns identified by city residents, businesses, decision-makers, and other stakeholders; protects Lake Forest's family-oriented environment, character, and sense of community; provides a range of high-quality housing options; attracts and retains businesses and industries that provide high-quality and high-paying jobs so that residents can live and work in Lake Forest; expands retail shopping opportunities to provide better local services and increased sales tax revenues; continues to maintain the road network and improve multimodal transportation opportunities; maintains strong fiscal sustainability and continues to provide efficient and adequate public services; and addresses new requirements of State law.

SUMMARY OF IMPACTS AND MITIGATION MEASURES

In accordance with the CEQA Guidelines, this EIR focuses on the project's significant effects on the environment. The CEQA Guidelines defines a significant effect as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project. A less than significant effect is one in which there is no long or short-term significant adverse change in environmental conditions. Some impacts are reduced to a less than significant level with the implementation of mitigation measures and/or compliance with regulations. "Beneficial" effect is not defined in the CEQA Guidelines, but for purposes of this EIR a beneficial effect is one in which an environmental condition is enhanced or improved.

The environmental impacts of the proposed project, the impact level of significance prior to mitigation, the proposed mitigation measures to mitigate an impact, and the impact level of significance after mitigation are summarized in Table ES-2.

TABLE ES-2: PROJECT IMPACTS AND PROPOSED MITIGATION MEASURES

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
AESTHETICS			
Impact 3.1-1: General Plan implementation would not have a substantial adverse effect on a scenic vista	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.1-2: General Plan implementation would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway	LS	*None Required*	LS
Impact 3.1-3: General Plan implementation would not, in a non-urbanized area, substantially degrade the existing visual character or quality of public views of the site and its surroundings, or in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality	LS	*None Required*	LS
Impact 3.1-4: General Plan implementation could result in the creation of new sources of nighttime lighting and daytime glare	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
AGRICULTURAL AND FOREST RESOURCES			
Impact 3.2-1: General Plan implementation would result in the conversion of farmlands, including Prime Farmland and Unique Farmland, to non-agricultural use	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	SU

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
Impact 3.2-2: General Plan implementation would not result in conflicts with existing zoning for agricultural use, or a Williamson Act contract	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.2-3: General Plan implementation would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use	LS	*None Required*	LS
AIR QUALITY			
Impact 3.3-1: General Plan implementation would not conflict with or obstruct implementation of the applicable air quality plan	LS	*None Required*	LS
Impact 3.3-2: General Plan implementation would result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	SU
Impact 3.3-3: General Plan implementation would expose sensitive receptors to substantial pollutant concentrations	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	SU
Impact 3.3-4: General Plan implementation would result in other emissions (such as those leading to odors adversely affecting a substantial	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	SU

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
number of people)			
Biological Resources			
Impact 3.4-1: General Plan implementation could have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.4-2: General Plan implementation could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.4-3: General Plan implementation could have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.4-4: General Plan implementation would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites			
Impact 3.4-5: The General Plan would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance	LS	*None Required*	LS
Impact 3.4-6: General Plan implementation would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
CULTURAL AND TRIBAL RESOURCES			
Impact 3.5-1: General Plan implementation could cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to Section15064.5	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.5-2: Implementation of the General Plan could lead to the disturbance of any human remains	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.5-3: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074, and that is: Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
resources as defined in Public Resources Code Section 5020.1(k), or a resource determined by the lead agency			
Geology			
Impact 3.6-1: General Plan implementation has the potential to expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.6-2: General Plan implementation has the potential to result in substantial soil erosion or the loss of topsoil	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.6-3: General Plan implementation has the potential to result in development located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.6-4: General Plan implementation has the potential to result in development on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*
PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
property			
Impact 3.6-5: General Plan implementation does not have the potential to have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water	LS	*None Required*	LS
Impact 3.6-6: General Plan implementation has the potential to directly or indirectly destroy a unique paleontological resource	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
GREENHOUSE GAS EMISSIONS AND ENERGY			
Impact 3.7-1: General Plan implementation has the potential to generate GHG emissions that could have a significant impact on the environment	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.7-2: General Plan implementation has the potential to conflict with adopted plans, policies, or regulations adopted for the purpose of reducing greenhouse gas emissions	LS	*None Required*	LS
Impact 3.7-3: General Plan implementation has the potential to result in a significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency	LS	*None Required*	LS

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PS – potentially significant *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
Hazards and Hazardous Materials			
Impact 3.8-1: General Plan implementation has the potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.8-2: General Plan implementation has the potential to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.8-3: General Plan implementation has the potential to have projects located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.8-4: General Plan implementation is not located within an airport land use plan, two miles of a public airport or public use airport, and would not result in a safety hazard for people residing or working in the project area	LS	*None Required*	LS
Impact 3.8-5: General Plan implementation has the potential to impair implementation of or physically interfere with an adopted emergency	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS

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PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
response plan or emergency evacuation plan			
Impact 3.8-6: General Plan implementation has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	SU
HYDROLOGY AND WATER QUALITY			
Impact 3.9-1: General Plan implementation could violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality or obstruct implementation of a water quality control plan	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.9-2: General Plan implementation could result in the depletion of groundwater supplies or interfere substantially with groundwater recharge or conflict with a groundwater management plan.	LS	*None Required*	LS
Impact 3.9-3: General Plan implementation could alter the existing drainage pattern in a manner which would result in substantial erosion, siltation, flooding, impeded flows, or polluted runoff	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.9-4: General Plan implementation would not release pollutants due to project inundation by flood hazard, tsunami, or seiche.	LS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS

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PS – potentially significant *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
Land Use Planning and Population/Housing			
Impact 3.10-1: General Plan implementation would not physically divide an established community	LS	*None Required*	LS
Impact 3.10-2: General Plan implementation would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect	LS	*None Required*	LS
Impact 3.10-3: General Plan implementation would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)	LS	*None Required*	LS
Impact 3.10-4: General Plan implementation would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere	LS	*None Required*	LS
Mineral Resources			
Impact 3.11-1: General Plan implementation would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state	LS	*None Required*	LS

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PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
Impact 3.11-2: General Plan implementation would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan	LS	*None Required*	LS
NOISE			
Impact 3.12-1: General Plan implementation may result in substantial noise increase from traffic noise sources	LS	*None Required*	LS
Impact 3.12-2: General Plan implementation may result in exposure to excessive railroad noise sources	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.12-3: Implementation of the General Plan could result in the generation of excessive stationary noise sources	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.12-4: General Plan implementation may result in an increase in construction noise sources (Less than Significant)	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.12-5: General Plan implementation may result in construction vibration	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.12-6: General Plan implementation may result in exposure to groundborne vibration	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.12-7: General Plan implementation	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC

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Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
may result in cumulative noise impacts			

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PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
PUBLIC SERVICES AND RECREATION			
Impact 3.13-1: General Plan implementation could result in adverse physical impacts on the environment associated with the need for new governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts and the provision of public services	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.13-2: General Plan implementation may result in adverse physical impacts associated with the deterioration of existing parks and recreation facilities or the construction of new parks and recreation facilities	LS	*None Required*	LS
TRANSPORTATION			
Impact 3.14-1: General Plan implementation would not increase VMT per person above No Project conditions	LS	*None Required*	LS
Impact 3.14-2: General Plan implementation would not conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways	LS	*None Required*	LS

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PS – potentially significant *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
Impact 3.14-3: General Plan implementation would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	LS	*None Required*	LS
Impact 3.14-4: General Plan implementation would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)	LS	*None Required*	LS
Impact 3.14-5: General Plan implementation would not result in inadequate emergency access	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.14-6: General Plan implementation would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Utilities and Service Systems			
Impact 3.15-1: General Plan implementation would result in sufficient water supplies available to serve the City and reasonably foreseeable future development during normal, dry and multiple dry years	LS	*None Required*	LS

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PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
Impact 3.15-2: General Plan implementation may require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects	LS	*None Required*	LS
Impact 3.15-3: General Plan implementation has the potential to result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments	LS	*None Required*	LS
Impact 3.15-4: General Plan implementation may require or result in the relocation or construction of new or expanded wastewater facilities, the construction or relocation of which could cause significant environmental effects	LS	*None Required*	LS
Impact 3.15-5: General Plan implementation may require or result in the relocation or construction of new or expanded storm water drainage facilities, the construction or relocation of which could cause significant environmental effects	LS	*None Required*	LS
Impact 3.15-6: General Plan implementation would comply with federal, state, and local management and reduction statutes and regulations related to solid waste, and would not generate solid waste in excess of State or local	LS	*None Required*	LS

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PS – potentially significant *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals			
Wildfires			
Impact 3.16-1: General Plan implementation could substantially impair an adopted emergency response plan or emergency evacuation plan	LS	*None Required*	LS
Impact 3.16-2: General Plan implementation could, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire	LS	*None Required*	LS
Impact 3.16-3: Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS
Impact 3.16-4: Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LS

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PS – potentially significant *SU – significant and unavoidable*

ENVIRONMENTAL IMPACT	*LEVEL OF SIGNIFICANCE WITHOUT MITIGATION*	*MITIGATION MEASURE*	*RESULTING LEVEL OF SIGNIFICANCE*
OTHER CEQA-REQUIRED TOPICS			
Impact 4.1: Cumulative degradation of the existing visual character of the region	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.2: Cumulative impact to agricultural lands and resources	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	CC and SU
Impact 4.3: Cumulative impact on the region's air quality	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	CC and SU
Impact 4.4: Cumulative loss of biological resources, including habitats and special status species	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.5: Cumulative impacts on known and undiscovered cultural resources	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.6: Cumulative impacts related to geology and soils	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.7: Cumulative impacts related to greenhouse gases, climate change, and energy	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.8: Cumulative impacts related to hazardous materials and human health risks	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	CC and SU
Impact 4.9: Cumulative impacts related to hydrology and water quality	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.10: Cumulative impacts related to local land use, population, and housing	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC

CC – cumulatively considerable *LCC – less than cumulatively considerable* *LS – less than significant*

PS – potentially significant *SU – significant and unavoidable*

Environmental Impact	*Level of Significance Without Mitigation*	*Mitigation Measure*	*Resulting Level of Significance*
Impact 4.11: Cumulative impacts related to mineral resources	LS	*None Required*	LCC
Impact 4.12: Cumulative impacts related to noise	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.13: Cumulative impacts to public services and recreation	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.14: Cumulative impacts on the transportation network	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.15: Cumulative impacts related to utilities	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.16: Cumulative impact related to wildfire	PS	*General Plan Policies and Actions mitigate this impact to a less than significant level.*	LCC
Impact 4.17: Irreversible Effects	PS	*Mitigated to the greatest extent feasible through General Plan Policies and Actions. No additional feasible mitigation is available.*	SU

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PS – potentially significant *SU – significant and unavoidable*

1.1 INTRODUCTION

In early 2018, Lake Forest began a multi-year process to update the City's General Plan. State law requires every city and county in California to prepare and maintain a planning document called a general plan. A general plan is a "constitution" or "blueprint" for the future physical development of a county or city. As part of the Lake Forest General Plan Update process, a General Plan Existing Conditions Report was prepared to establish a baseline of existing conditions in the City. Additionally, an Issues and Challenges Report and a Land Use Themes Report were prepared to identify the challenges facing the community, to provide an opportunity for citizens and policymakers to come together in a process of developing a common vision for the future, and to identify a range of options available to the City as the General Plan Land Use Map was modified and updated.

The updated Lake Forest General Plan includes a framework of goals, policies, and actions that will guide the community toward its common vision. The General Plan is supported with a variety of maps, including a Land Use Map and Circulation Diagram.

LAKE FOREST GENERAL PLAN UPDATE

General Plan

The 2040 Lake Forest General Plan (General Plan, General Plan Update, or proposed project) is the overarching policy document that guides land use, housing, transportation, open space, public safety, community services, and other policy decisions throughout Lake Forest. The General Plan includes the seven elements mandated by State law, to the extent that they are relevant locally, including: Circulation, Conservation, Housing, Land Use, Noise, Open Space, and Safety. The City may also address other topics of interest; this General Plan includes elements related to Public Facilities (including infrastructure), Economic Development, and Health and Wellness. The General Plan sets out the goals, policies, and actions in each of these areas, serves as a policy guide for how the City will make key planning decisions in the future, and guides how the City will interact with Orange County, surrounding cities, and other local, regional, State, and Federal agencies.

The General Plan contains the goals and policies that will guide future decisions within the City. It also identifies implementation programs, in the form of actions, that will ensure the goals and policies in the General Plan are carried out. As part of the Lake Forest General Plan Update, the City and the consultant team prepared several support documents that serve as the building blocks for the General Plan and analyze the environmental impacts associated with implementing the General Plan.

The following paragraphs summarize the key component documents that are the building blocks of the Lake Forest General Plan.

Existing Conditions Report

The Existing Conditions Report takes a “snapshot” of Lake Forest’s current (2017-2018) trends and conditions. It provides a detailed description of a wide range of topics within the City, such as demographic and economic conditions, land use, public facilities, and environmental resources. The Existing Conditions Report provides decision-makers, the public, and local agencies with context for making policy decisions. The Existing Conditions Report also provides the environmental setting and description contained within this Draft Environmental Impact Report (EIR).

Issues and Challenges Report

Based on public input from community visioning workshops, online surveys, and General Plan Advisory Committee meetings, information contained in the Existing Conditions Report, stakeholder interviews, and direction from City staff, the Issues and Challenges Report identifies key issues and challenges to be addressed in the General Plan and summarizes input provided by participants of the visioning workshops. The Issues and Challenges Report provided the General Plan Advisory Committee and the City Council with tools and information for the development of the General Plan and associated Land Use Map and Circulation Diagrams.

Land Use Themes Report

The Land Use Themes Report presents four different Land Use Theme alternatives: Business as Usual, Expanded Housing Growth, Expanded Employment Growth, and Mixed Growth. An analysis of the land use, circulation, fiscal sustainability, economic development, and infrastructure effects relative to each theme is provided. The report is accompanied by a detailed fiscal analysis that addresses long-range fiscal impacts in terms of the cost to provide services to projected land uses and growth versus the revenues generated under each alternative.

Environmental Impact Report

An EIR responds to the requirements of the California Environmental Quality Act (CEQA) as set forth in Sections 15126, 15175, and 15176 of the CEQA Guidelines. The Planning Commission and City Council will use the EIR during the General Plan Update process in order to understand the potential environmental implications associated with implementing the General Plan. This EIR was prepared concurrently with the General Plan policy document in order to facilitate the development of a General Plan that is largely self-mitigating. In other words, as environmental impacts associated with the new General Plan, including the Land Use Map, were identified; policies and actions were incorporated into the General Plan policy document in order to reduce or avoid potential environmental impacts.

1.2 PURPOSE OF THE EIR

The City of Lake Forest, as lead agency, determined that the Lake Forest General Plan Update is a "project" within the meaning of CEQA. CEQA requires the preparation of an EIR prior to approving any project that may have a significant impact on the environment. For the purposes of CEQA, the term "project" refers to the whole of an action, which has the potential for resulting in a direct

physical change or a reasonably foreseeable indirect physical change in the environment (CEQA Guidelines Section 15378[a]).

This Draft EIR has been prepared according to CEQA requirements to evaluate the potential environmental impacts associated with the implementation of the Lake Forest General Plan. A copy of the Public Draft General Plan is located on the Lake Forest General Plan Update website, at www.lakeforest.generalplan.org. The Draft EIR also discusses alternatives to the General Plan, and proposes mitigation measures that will offset, minimize, or otherwise avoid potentially significant environmental impacts. This Draft EIR has been prepared in accordance with CEQA, California Resources Code Section 21000 et seq.; the Guidelines for the California Environmental Quality Act (California Code of Regulations, Title 14, Chapter 3); and the rules, regulations, and procedures for implementing CEQA as adopted by the City of Lake Forest.

An EIR must disclose the expected direct and indirect environmental impacts associated with a project, including impacts that cannot be avoided, growth-inducing effects, impacts found not to be significant, and significant cumulative impacts, as well as identify mitigation measures and alternatives to the proposed project that could reduce or avoid its adverse environmental impacts. CEQA requires government agencies to consider and, where feasible, minimize significant environmental impacts of proposed development.

1.3 TYPE OF EIR

The State CEQA Guidelines identify several types of EIRs, each applicable to different project circumstances. This EIR has been prepared as a Program EIR pursuant to CEQA Guidelines Section 15168. Section 15168 states:

"A program EIR is an EIR which may be prepared on a series of actions that can be characterized as one large project and are related either:

1) Geographically;
2) As logical parts in the chain of contemplated actions;
3) In connection with issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program; or
4) As individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects which can be mitigated in similar ways."

The program-level analysis considers the broad environmental effects of the proposed project. This EIR will be used to evaluate subsequent projects and activities under the proposed project. This EIR is intended to provide the information and environmental analysis necessary to assist public agency decision-makers in considering approval of the proposed project, but not to the level of detail to consider approval of subsequent development projects that may occur after adoption of the General Plan.

Additional environmental review under CEQA may be required for subsequent projects and would be generally based on the subsequent project's consistency with the General Plan and the analysis

in this EIR, as required under CEQA. It may be determined that some future projects or infrastructure improvements may be exempt from environmental review. When individual subsequent projects or activities under the General Plan are proposed, the lead agency that would approve and/or implement the individual project will examine the projects or activities to determine whether their effects were adequately analyzed in this program EIR (CEQA Guidelines Section 15168). If the projects or activities would have no effects beyond those disclosed in this EIR, no further CEQA compliance would be required.

1.4 INTENDED USES OF THE EIR

The City of Lake Forest, as the lead agency, has prepared this EIR to provide the public and responsible and trustee agencies with an objective analysis of the potential environmental impacts resulting from adoption of the Lake Forest General Plan and subsequent implementation of projects consistent with the General Plan. The environmental review process enables interested parties to evaluate the proposed project in terms of its environmental consequences, to examine and recommend methods to eliminate or reduce potential adverse impacts, and to consider a reasonable range of alternatives to the project. While CEQA requires that consideration be given to avoiding adverse environmental effects, the lead agency must balance adverse environmental effects against other public objectives, including the economic and social benefits of a project, in determining whether a project should be approved.

This EIR will be used as the primary environmental document to evaluate all subsequent planning and permitting actions associated with the General Plan. Subsequent actions that may be associated with the General Plan are identified in Chapter 2.0, Project Description. This EIR may also be used by other agencies within Orange County.

1.5 KNOWN RESPONSIBLE AND TRUSTEE AGENCIES

The term “Responsible Agency” includes all public agencies other than the Lead Agency that have discretionary approval power over the project or an aspect of the project (CEQA Guidelines Section 15381). For the purpose of CEQA, a “Trustee” agency has jurisdiction by law over natural resources that are held in trust for the people of the State of California (CEQA Guidelines Section 15386). While no Responsible Agencies or Trustee Agencies are responsible for approvals associated with adoption of the Lake Forest General Plan, implementation of future projects within Lake Forest may require permits and approvals from such agencies, which may include the following:

- California Department of Fish and Wildlife (CDFW);
- California Department of Transportation (Caltrans);
- Regional (Central Valley) Water Quality Control Board (RWQCB);
- U.S. Army Corps of Engineers (ACOE);
- U.S. Fish and Wildlife Service (USFWS);
- Orange County Local Agency Formation Commission (LAFCO);
- South Coast Air Quality Management District (SCAQMD);
- Orange County Airport Land Use Commission (ALUC).

1.6 ENVIRONMENTAL REVIEW PROCESS

The review and certification process for the EIR has involved, or will involve, the following general procedural steps:

NOTICE OF PREPARATION

The City of Lake Forest circulated a Notice of Preparation (NOP) of an EIR for the proposed project on September 5, 2019 to trustee and responsible agencies, the State Clearinghouse, and the public. A scoping meeting was held on September 24, 2019 at the City of Lak Forest City Hall. No public or agency comments on the NOP related to the EIR analysis were presented or submitted during the scoping meeting. However, during the 30-day public review period for the NOP, which ended on October 4, 2019, four written comment letters were received on the NOP. A summary of the NOP comments is provided later in this chapter. The NOP and all comments received on the NOP are presented in Appendix A.

DRAFT EIR

This document constitutes the Draft EIR. The Draft EIR contains a description of the project, description of the environmental setting, identification of the project's direct and indirect impacts on the environment and mitigation measures for impacts found to be significant, as well as an analysis of project alternatives, identification of significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. This Draft EIR identifies issues determined to have no impact or a less than significant impact, and provides detailed analysis of potentially significant and significant impacts. Comments received in response to the NOP were considered in preparing the analysis in this EIR. Upon completion of the Draft EIR, the City of Lake Forest will file the Notice of Completion (NOC) with the State Clearinghouse of the Governor's Office of Planning and Research to begin the public review period.

PUBLIC NOTICE/PUBLIC REVIEW

Concurrent with the NOC, the City of Lake Forest will provide a public notice of availability for the Draft EIR, and invite comment from the general public, agencies, organizations, and other interested parties. Consistent with CEQA requirements, the review period for this Draft EIR is forty-five (45) days. Public comment on the Draft EIR will be accepted in written form. All comments or questions regarding the Draft EIR should be addressed to:

Gayle Ackerman, AICP, Director of Community Development
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

RESPONSE TO COMMENTS/FINAL EIR

Following the public review period, a Final EIR will be prepared. The Final EIR will respond to both oral and written comments received during the public review period.

CERTIFICATION OF THE EIR/PROJECT CONSIDERATION

The City of Lake Forest City Council will review and consider the Final EIR. If the City finds that the Final EIR is "adequate and complete," the City Council may certify the Final EIR in accordance with CEQA. As set forth by CEQA Guidelines Section 15151, the standards of adequacy require an EIR to provide a sufficient degree of analysis to allow decisions to be made regarding the proposed project that intelligently take account of environmental consequences.

Upon review and consideration of the Final EIR, the City Council may take action to approve, revise, or deny the project. It the EIR determines that the project would result in significant adverse impacts to the environment that cannot be mitigated to less than significant levels, the City Council would be required to adopt a statement of overriding considerations as well as written findings in accordance with State CEQA Guidelines Sections 15091 and 15093. If additional mitigation measures are required (beyond the General Plan policies and actions that reduce potentially significant impacts, as identified throughout this EIR), a Mitigation Monitoring and Reporting Program (MMRP) would also be adopted in accordance with Public Resources Code Section 21081.6(a) and CEQA Guidelines Section 15097 for mitigation measures that have been incorporated into or imposed upon the project to reduce or avoid significant effects on the environment. The MMRP would be designed to ensure that these measures are carried out during project implementation, in a manner that is consistent with the EIR.

1.7 ORGANIZATION AND SCOPE

Sections 15122 through 15132 of the State CEQA Guidelines identify the content requirements for Draft and Final EIRs. An EIR must include a description of the environmental setting, an environmental impact analysis, mitigation measures for any significant impacts, alternatives, significant irreversible environmental changes, growth-inducing impacts, and cumulative impacts. The EIR prepared reviews environmental and planning documentation developed for the project, environmental and planning documentation prepared for recent projects located within the city of Lake Forest, and responses to the Notice of Preparation (NOP).

This Draft EIR is organized in the following manner:

EXECUTIVE SUMMARY

The Executive Summary summarizes the characteristics of the proposed project, known areas of controversy and issues to be resolved, and provides a concise summary matrix of the project's environmental impacts and possible mitigation measures. This chapter identifies alternatives that reduce or avoid at least one significant environmental effect of the proposed project.

CHAPTER 1.0 - INTRODUCTION

Chapter 1.0 briefly describes the proposed project, the purpose of the environmental evaluation, identifies the lead, trustee, and responsible agencies, summarizes the process associated with preparation and certification of an EIR, identifies the scope and organization of the Draft EIR, and summarizes comments received on the NOP.

CHAPTER 2.0 - PROJECT DESCRIPTION

Chapter 2.0 provides a detailed description of the proposed project, including the location, intended objectives, background information, the physical and technical characteristics, including the decisions subject to CEQA, subsequent projects and activities, and a list of related agency action requirements.

CHAPTER 3.0 - ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

Chapter 3.0 contains an analysis of environmental topic areas as identified below. Each subchapter addressing a topical area is organized as follows:

Environmental Setting. A description of the existing environment as it pertains to the topical area.

Regulatory Setting. A description of the regulatory environment that may be applicable to the project.

Impacts and Mitigation Measures. Identification of the thresholds of significance by which impacts are determined, a description of project-related impacts associated with the environmental topic, identification of appropriate mitigation measures, and a conclusion as to the significance of each impact.

The following environmental topics are addressed in this section:

- Aesthetics and Visual Resources
- Agricultural and Forest Resources
- Air Quality
- Biological Resources
- Cultural and Tribal Resources
- Geology and Soils
- Greenhouse Gas Emissions, Climate Change, and Energy
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services and Recreation

- Transportation and Traffic
- Utilities
- Wildfires

CHAPTER 4.0 - OTHER CEQA-REQUIRED TOPICS

Chapter 4.0 evaluates and describes the following CEQA required topics: impacts considered less-than-significant, significant and irreversible impacts, growth-inducing effects, cumulative impacts, and significant and unavoidable environmental effects.

CHAPTER 5.0 - ALTERNATIVES

Chapter 5.0 provides a comparative analysis between the merits of the proposed project and the selected alternatives. State CEQA Guidelines Section 15126.6 requires that an EIR describe a range of reasonable alternatives to the project, which could feasibly attain the basic objectives of the project and avoid and/or lessen any significant environmental effects of the project.

CHAPTER 6.0 - REPORT PREPARERS

Chapter 6.0 lists all authors and agencies that assisted in the preparation of the Draft EIR, by name, title, and company or agency affiliation.

APPENDICES

This section includes all notices and other procedural documents pertinent to the Draft EIR, as well as technical material prepared to support the analysis.

1.8 COMMENTS RECEIVED ON THE NOTICE OF PREPARATION

The City received four comment letters on the NOP. Copies of these letters are provided in Appendix A of this Draft EIR and the comments are summarized below.

- City of Laguna Beach: The City of Laguna Beach requested timely written notice of all proposed projects within the City of Lake Forest, near SR 73, Lake Forest Drive, and/or El Toro Road for which an EIR, Negative Declaration, or Mitigated Negative Declaration will be prepared, including the General Plan Update.
- Native American Heritage Commission: The Native American Heritage Commission provided direction regarding tribal consultation in accordance with Assembly Bill 52 and Senate Bill 18.
- California Department of Transportation (Caltrans): Caltrans suggested information to include in the EIR traffic study and provided input with respect to content of the General Plan related to multimodal planning, freight, climate change, the Americans with Disabilities Act, and encroachment permits.
- Orange County Transportation Authority (OCTA): OCTA provided comments regarding the Master Plan of Arterial Highways for consideration in preparing the EIR.

2.1 BACKGROUND AND OVERVIEW

STATE GENERAL PLAN LAW

California Government Code Section 65300 et seq. requires all counties and cities to prepare and maintain a general plan for the long-term growth, development, and management of the land within the jurisdiction's planning boundaries. The general plan acts as a "constitution" for development, and is the jurisdiction's lead legal document in relation to growth, development, and resource management issues. Development regulations (e.g., zoning and subdivision standards) are required by law to be consistent with the general plan.

General plans must address a broad range of topics, including, at a minimum, the following mandatory elements: land use, circulation, housing, conservation, open space, noise, and safety. General plans must also address the topics of environmental justice and climate change and resiliency planning, either as separate elements or as part of other required elements. At the discretion of each jurisdiction, the general plan may combine these elements and may add optional elements relevant to the physical features of the jurisdiction.

The California Government Code also requires that a general plan be comprehensive, internally consistent, and plan for the long term. The general plan should be clearly written, easy to administer, and available to all those concerned with the community's development.

State planning and zoning law (California Government Code Section 65000 et seq.) establishes that zoning ordinances are required to be consistent with the general plan and any applicable specific plans, area plans, master plans, and other related planning documents. When amendments to the general plan are made, corresponding changes in the zoning ordinance may be required within a reasonable time to ensure consistency between the revised land use designations in the general plan (if any) and the permitted uses or development standards of the zoning ordinance (Gov. Code Section 65860, subd. [c]).

GENERAL PLAN UPDATE PROCESS

The City of Lake Forest was incorporated in 1991 and adopted its first General Plan in 1994 to guide its physical development. Since that time, the City's General Plan has been periodically amended, including updates to the Land Use and Circulation Elements in 2008 to reflect growth plans for the 838-acre area near the 241 Toll Road referred to as the Opportunity Study Area and updates to its Housing Element in accordance with State of California requirements. In September of 2017, the City issued a request for proposals (RFP) inviting bids from qualified consulting firms to assist the City in the preparation of a comprehensive update to the General Plan.

The process to update the Lake Forest General Plan began in January 2018 and is scheduled to be completed with the adoption of the updated Lake Forest General Plan by the City Council in January 2020. The Lake Forest General Plan (General Plan or proposed project) was developed with extensive community input and reflects the community's vision for Lake Forest. A summary of the community outreach and public participation process is provided below.

Outreach Objectives

Objectives established for the comprehensive outreach program were to:

- Educate the public on the City's history, existing conditions, socioeconomic trends, and fiscal health
- Develop a long-term vision for Lake Forest
- Build capacity for future public outreach efforts
- Engage key stakeholders to perpetuate long-term involvement
- Engage a broad spectrum of the City's community members
- Raise the profile of the General Plan and establish a greater connection to current planning issues

Visioning Workshops

The City hosted General Plan Update Visioning Workshops in May, June and July 2018, one each month. Each Workshop focused on addressing a different topic. Each Workshop included a brief overview of the General Plan, including why it's important and why the City is updating its Plan, some background information on the evening's topic, and a series of facilitated activities to solicit input on key topics or ideas.

The first General Plan Visioning Workshop was held on Wednesday May 16, 2018 at the Lake Forest City Hall from 6:30 PM - 8:00 PM. Approximately 15 individuals attended this Workshop. The intent of the first Workshop was to begin a dialogue with the community regarding its priorities for the next 20 years. Following a brief presentation on the General Plan Update, the consultant team facilitated two activities to help conduct this conversation. The first activity was to identify assets, vision ideals, and challenges facing Lake Forest, and the second activity was to identify opportunity areas that warranted additional land use and/or policy direction.

The second Visioning Workshop was held on Wednesday June 13, 2018 at City Hall from 6:30 PM - 8:00 PM. Approximately 25 people attended this event. The focus of the second Workshop was on transportation and mobility in Lake Forest, including how people get around (cars, walking, biking, transit) and regional transit connections. The presentation included background on existing conditions, such as existing traffic volumes, transit routes, and accident information. The group also reviewed existing commute patterns (where do people who live in Lake Forest go for work, and where do people who work in Lake Forest commute from).

The third and final Visioning Workshop was held on Wednesday July 11, 2018 at City Hall from 6:30 PM to 8:00 PM. Approximately 40 people attended this event. The focus of the last Workshop was on land use and community design. The discussion focused on better understanding the community's vision for the following five focus areas: Foothill Ranch Towne Centre, El Toro Rd/I-5 Corridor, Lake Forest Drive Corridor, Civic Center Area, and the Light Industrial/Rail Corridor. As part of the overview presentation, the group considered how local and regional socioeconomic trends shape land use planning in Lake Forest. Representatives from the City's Homeowners Associations were personally invited to participate in this workshop.

The topics explored in each Workshop along with summaries of the input provided by the community are provided in the Vision and Values Outreach Summary Report, which is available for review online at: www.lakeforest.generalplan.org.

Pop-up Events

To connect with a broad audience throughout Lake Forest, the City hosted two Pop-up Events where the project team was able to educate the community on the General Plan and better understand what residents love most about living in the City.

BUNNY BLAST

On Saturday March 24, 2018, the City of Lake Forest hosted Bunny Blast, an annual event for the entire family, at El Toro Park. The day included a range of activities including game booths, rides, and music. The General Plan Update hosted a booth inviting attendees to share what they "love about Lake Forest" and spin the prize wheel. Project factsheets were also available along with small business cards highlighting the project website and contact information. Throughout the day, the project team spoke with over 200 community members to let them know about the General Plan Update project, including what topics the General Plan will address and why the City is updating its Plan, and to hear what each person loved most about their community.

The top responses received included "Parks", "Community", "Nature" and "Events". All of these special qualities were identified more than a dozen times. Other key topics and issues identified by the community included: "Mobility", "Retail/Shops", "Schools", "Safety", "Location", and "Recreation".

NATIONAL NIGHT OUT

On Tuesday August 7, 2018, the City of Lake Forest hosted National Night Out, an annual community-building event that promotes police-community partnerships and neighborhood camaraderie. The General Plan Update team hosted a booth inviting attendees to share what they "love about Lake Forest". Project factsheets and website small business cards were provided, along with copies of the General Plan Advisory Committee (GPAC) Statement of Interest form. Throughout the evening, the project team spoke with over 100 community members of all ages regarding their favorite things about Lake Forest.

The top three responses were the same as those received at Bunny Blast: "Parks", "Community" and "Nature". These three responses were identified at least 10 times each.

Online Surveys and Polls

The City of Lake Forest hosted a Vision and Values Survey which was facilitated online. The survey was open from May 15 through July 13, 2018 and was administered online via the SurveyMonkey web platform. During the approximately two-month time period that the survey was active, there were 824 responses to the eighteen primary questions related to the General Plan update. The questions involved a wide range of response formats that are synthesized as one component of the Visioning and Values Report. The survey responses provide insight into the demographics and

opinions of Lake Forest community members concerning goals and topics related to the update of the City's General Plan.

Based on the demographic questions within the survey, the online survey attracted those Lake Forest residents with families and children. Respondents to the survey tended to be in their family-forming years, or later, and have more than one child. The survey had less representation from single-person households, renters, and younger residents than the typical resident demographics for the City of Lake Forest. Of the participating community members, survey respondents prioritized the following themes:

- community safety
- improved entertainment options
- open spaces
- housing affordability
- traffic calming.

Detailed survey results and responses are contained in Appendix B of the Vision and Values Summary Report, which is available for review online at: www.lakeforest.generalplan.org.

General Plan Advisory Committee

The 18-member General Plan Advisory Committee (GPAC), which consisted of residents, homeowners association representatives, business leaders, and representatives from the school district, Community Services Commission, Traffic and Parking Commission, and Planning Commission, among others, collaborated with City staff and the General Plan Update consultant team throughout the development of the General Plan. The Advisory Committee met 11 times between September 2018 and September 2019 to identify key issues and challenges that Lake Forest faces over the next 20 years, prepare a Community Vision Statement, and develop the comprehensive set of goals and policies contained in the General Plan. Each General Plan Advisory Group meeting was open to the public. All meeting materials are available on the project website at www.lakeforest.generalplan.org.

City Council Briefings

The City Council received quarterly briefings from City Staff and the Consultant team (for a total of 6 briefings) to review input from the Visioning Workshops, receive information relevant to the specific topics addressed at the General Plan Advisory Group meetings, and provide specific direction and guidance to staff and the consultant team regarding the Community Vision Statement and the Land Use Themes Report/development of the Benchmark Plan which is analyzed in this Environmental Impact Report.

Community Open Houses on Draft General Plan

The community was invited to two open houses on the General Plan, which were held on November 12, 2019 at the El Toro Library and on November 13, 2019 at City Hall. At both open houses, the City hosted tables focusing on key topics/components of the General Plan (such as land use, community design, transportation, and public facilities) and shared key goals, policies,

and actions included in the General Plan to address these topics. Community members were able to ask questions of City Staff and the Consultant team and learn more about the future of Lake Forest.

Public Outreach

For all public workshops and meetings, the City of Lake Forest conducted extensive outreach, using a wide variety of methods and tools, to inform and encourage the community to participate in the General Plan Update process. The following is a list of methods and tools used to inform the public of meetings, workshops, and the status of the General Plan Update work efforts.

- General Plan Website: The City maintains a website (www.lakeforest.generalplan.org) devoted to informing the public about, and encouraging participation in, the General Plan Update process. The website includes all public notices, all workshop materials, presentations given to the GPAC and City Council, background materials, draft policy documents, and draft versions of the General Plan Land Use Map.
- Focus Group Briefings: The City held General Plan Update briefings with interested focus groups including the Executive Committee Roundtable, the Hospitality Roundtable, and the Homeowners Association Roundtable.
- E-mail distribution list: This list was developed and maintained over time, and included approximately 345 agencies, organizations, stakeholders, and individuals.
- Social Media: The City regularly posted meeting notices and project updates to its social media platforms, including NextDoor, Facebook, Instagram, and Twitter. The project was also provided in a "Mayor's Minute" video which was posted to Facebook and YouTube. All three Visioning Workshops were also broadcast via Facebook Live on the City of Lake Forest's Facebook page.
- Flyers: Flyers were posted at City Hall and at key locations throughout the community advertising the Visioning Workshops and online survey.

2.2 PROJECT LOCATION

REGIONAL SETTING

The City of Lake Forest is located in the heart of South Orange County and the Saddleback Valley, approximately 47 miles southeast of Los Angeles. Lake Forest was incorporated as a city in 1991 to help ensure that it will always be an ideal place for business to prosper and people to live, worship, work and play. Since being incorporated, Lake Forest has expanded its limits to include the communities of Foothill Ranch and Portola Hills. These newer communities are master planned developments that brought homes and commercial centers to the Eastern boundary of Lake Forest throughout the 1990's. The total land area of Lake Forest is approximately 16 square miles.

Lake Forest is bordered to its north and northeast by the Santa Ana Mountains/County of Orange, the City of Mission Viejo to the east, the City of Laguna Hills to the south, and the City of Irvine to the west. Lake Forest is well-situated adjacent to the merger of the Interstate 5 and 405 Freeways and the Foothill and Eastern Transportation Corridors, which provide easy access to Los Angeles, San Diego, and the Inland Empire (see Figure 2.0-1).

Don Jose Serrano settled the area, which was originally called Rancho Canada De Los Alisos (the Valley of the Sycamores), through a Mexican Land Grant in 1846. The area then became known as El Toro, named after the bulls that roamed Don Jose Serrano's ranch. For more than a century, the land remained with Don Jose and his family until financial problems forced him to turn the land over to private interests. In the early 1900's, Dwight Whiting, a resident of the area, planted 400 acres of fast-growing eucalyptus trees in this growing agricultural community as an answer to the California lumber shortage. Shortly following World War II, residential, commercial, and industrial development began to replace the acres of farmland in the area. In the 1960's, master developer Occidental Petroleum decided to create a master-planned community around the abundant trees and man-made lakes. The eucalyptus trees provided landscaping for the new modern homes and led to the "Forest" in Lake Forest. During the peak of activity at the nearby El Toro Marine Base, the need for new homes and support services increased. Steadily, the Lake Forest area was built into the community it is today.

ENVIRONMENTAL IMPACT REPORT STUDY AREA

There are three key boundary lines addressed by the General Plan, which make up the study area for the General Plan Environmental Impact Report (EIR). These include the city limits, the Sphere of Influence (SOI), and the Planning Area, as shown on Figure 2.0-2 and described below. For the City of Lake Forest, its city limits, SOI, and Planning Area are all contiguous, and in general are referred to throughout this document as the City of Lake Forest or Planning Area, which represent the same physical boundary.

City Limits: Includes the area within the City's corporate boundary, over which the City exercises land use authority and provides public services.

Sphere of Influence (SOI): The probable physical boundary and service area of the City, as adopted by the Local Agency Formation Commission (LAFCO). An SOI may include both incorporated and unincorporated areas within which a city or special district will have primary responsibility for the provision of public facilities and services. Lake Forest's SOI is contiguous with its City Limits.

Planning Area: For the purposes of the General Plan, the Planning Area is defined as the area surrounding the city limits and SOI that is included in the analysis and planning for the 20-year horizon of the General Plan. Lake Forest's Planning Area is contiguous with its City Limits.

2.3 PROJECT OBJECTIVES

The Lake Forest General Plan is intended to reflect the desires and vision of Lake Forest's residents, businesses, the General Plan Advisory Committee, Planning Commission, City Council, and other decision-makers for the future development and operation of Lake Forest. The following objectives are identified for the proposed update to the General Plan:

1. Reflect the current goals and vision expressed by city residents, businesses, decision-makers, and other stakeholders;
2. Address issues and concerns identified by city residents, businesses, decision-makers, and other stakeholders;
3. Protect Lake Forest's family-oriented environment, character, and sense of community;
4. Provide a range of high-quality housing options;
5. Attract and retain businesses and industries that provide high-quality and high-paying jobs so that residents can live and work in Lake Forest;
6. Expand retail shopping opportunities to provide better local services and increased sales tax revenues;
7. Continue to maintain the road network and improve multimodal transportation opportunities;
8. Maintain strong fiscal sustainability and continue to provide efficient and adequate public services; and
9. Address new requirements of State law.

2.4 DESCRIPTION OF PROPOSED GENERAL PLAN PROJECT

The City of Lake Forest is preparing a comprehensive update to its existing General Plan, which was prepared in 1994 following the City's incorporation (a partial update involving the Land Use and Circulation Elements was completed in 2008). The General Plan Update is expected to be complete in early 2020.

The overall purpose of the Lake Forest General Plan is to create a policy framework that articulates a vision for the city's long-term physical form and development, while preserving and enhancing the quality of life for Lake Forest residents, and increasing opportunities for high-quality local job growth and housing options. The key components of the General Plan will include broad goals for the future of Lake Forest, and specific policies and actions that will help implement the stated goals.

This environmental impact report analyzes potential impacts to the environment associated with implementation and buildout of the proposed General Plan, which includes future development projects, infrastructure improvements, and the implementation of policies and actions included in the proposed General Plan. These proposed General Plan components are described in greater detail below.

GENERAL PLAN ELEMENTS

The Lake Forest General Plan will include a comprehensive set of goals, policies, and actions (implementation measures), as well as a revised Land Use Map (Figure 2.0-3). The State requires that the General Plan contain seven mandatory elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation, as well as address issues related to climate change and resiliency planning and environmental justice, either as separate Elements or as components of the required Element framework. The Lake Forest General Plan will include all of the State-mandated elements, as well as optional elements, including Community Design (combined with the Land Use Element), Public Facilities, Economic Development, and Community Health and Wellness.

- The **Land Use and Community Design Element** designates the general distribution and intensity of residential, commercial, industrial, open space, public/semi-public, and other categories of public and private land uses. The Land Use Element includes the Land Use Map, which identifies land use designations for each parcel in the City Limits and Planning Area (Figure 2.0-3). It also identifies high-level community design objectives for the City of Lake Forest, including the relationship between the public and private realm, streetscapes, best site planning practices, and placemaking strategies.
- The **Mobility Element** correlates closely with the Land Use Element and identifies the general locations and extent of existing and proposed major thoroughfares, transportation routes, and alternative transportation facilities necessary to support a multi-modal transportation system. This element is intended to facilitate mobility of people and goods throughout Lake Forest by a variety of transportation modes, including bicycle, pedestrian, and transit.
- The **Recreation and Resources Element** addresses the City's parks and recreation facilities and the conservation, development, and use of natural resources, riparian environments, native plant and animal species, soils, cultural/historical resources, air quality, and alternative energy. It also details objectives and measures for preserving open space for natural resources and the managed production of resources.
- The **Economic Development Element** seeks to sustain and diversify the city's economy, recognizing the importance of supporting existing and local businesses while broadening and expanding the employment base and economic opportunities within the city. Long-term fiscal sustainability will be supported by economic growth from increasing the range of business, commercial services, and high-quality jobs in the city. Providing a broader economic base is intended to improve the city's economic vitality while increasing access for residents to local goods and services and local employment opportunities.
- The **Public Facilities Element** includes goals, policies, and actions that address the following public services and facilities: police; fire protection; medical; schools; civic; library, water supplies, sewer services, storm drainage infrastructure, solid waste disposal and other community facilities. While not specifically required by State law for inclusion in the General Plan, the Public Facilities Element is a critical component in meeting the infrastructure and utility services needs of businesses and residents.

- The **Public Safety Element** establishes policies and programs to protect the community from risk associated with geologic, flood, and fire hazards, as well as setting standards for emergency preparedness. This element also addresses the required topics related to noise, including standards and policies to protect the community from the harmful and annoying effects of exposure to excessive noise levels. This element includes strategies to reduce land use conflicts that may result in exposure to unacceptable noise levels.
- The **Community Health and Wellness Element** acknowledges the profound effects of the built environment on travel choices, access to food, levels of physical activity, and exposure to risk from accidents or pollution. The Element addresses the topics of active living, healthy lifestyles, environmental justice, and community building.

GOALS, POLICIES, AND ACTIONS

Each element of the Lake Forest General Plan contains a series of goals and policies. The goals and policies provide guidance to the City on how to direct change, manage growth, and manage resources over the 20-year life of the General Plan. In order to ensure that the goals and policies in the General Plan are effectively implemented, a series of actions, or implementation measures have been developed. The implementation actions are located within the General Plan Implementation Program, which will be adopted as a separate, but complimentary document to the General Plan. The following provides a description of each and explains the relationship of each:

- A **goal** is a description of the general desired result that the City seeks to create through the implementation of the General Plan.
- A **policy** is a specific statement that guides decision-making as the City works to achieve its goals. Once adopted, policies represent statements of City regulations. The General Plan's policies set out the standards that will be used by City staff, the Planning Commission, and the City Council in their review of land development projects, resource protection activities, infrastructure improvements, and other City actions. Policies are on-going and require no specific action on behalf of the City.
- An **action** is an implementation measure, procedure, technique, or specific program to be undertaken by the City to help achieve a specified goal or implement an adopted policy. The City must take additional steps to implement each action in the General Plan. An action is something that can and will be completed.

GENERAL PLAN LAND USE MAP

The General Plan Land Use Map identifies land use designations for each parcel within the City Limits, SOI and Planning Area. The Lake Forest General Plan Land Use Map is attached as Figure 2.0-3.

GENERAL PLAN LAND USE DESIGNATIONS

The Land Use and Community Design Element of the Lake Forest General Plan defines various land use designations by their allowable uses, minimum parcel sizes, and maximum development densities. The following describes the proposed land use designations for the General Plan. Table 2.0-1 shows the total acreage for each land use designation shown on the proposed Land Use Map.

Residential Land Use Designations

Very Low Density Residential (VLDR); 0-2 du/ac – The Very Low-Density Residential land use designation provides for the development of single-family dwellings and accessory buildings at a maximum of two dwelling units per net acre of land.

Uses such as guest houses, religious facilities, public or private schools, family day care homes, public facilities, private recreation facilities, and others that are determined to be compatible with and oriented toward serving the needs of very low-density single-family neighborhoods may also be allowed.

Low Density Residential (LDR); 2-7 du/ac - The Low-Density Residential land use designation provides for the development of single-family dwellings and accessory buildings at a maximum of seven dwelling units per net acre of land.

Uses such as mobile homes, guest houses, religious facilities, public or private schools, family day care homes, public facilities, private recreation facilities, and others that are determined to be compatible with and oriented toward serving the needs of low-density single-family neighborhoods may also be allowed.

Low-Medium Density Residential; 7-15 du/ac - The Low Medium Density Residential land use designation provides for the development of a wide range of living accommodations, including single-family detached and attached dwelling units, mobile homes, duplexes, and multiple-family dwellings, such as townhomes, condominiums, apartments, and cooperatives. The designation allows a maximum of 15 dwelling units per net acre of land.

Uses such as religious facilities, public or private schools, community care facilities, family day care homes, public facilities, private recreation facilities, and others that are determined to be compatible with and oriented toward serving the needs of low medium density neighborhoods may also be allowed.

Residential Medium Density (MDR); 15-25 du/ac – The Medium Density Residential land use designation provides for the development of a wide range of living accommodations, including single-family dwelling units, and multiple-family dwellings, such as townhomes, condominiums, apartments, and cooperatives. The designation allows a maximum of 25 dwelling units per net acre of land.

Uses such as religious facilities, public or private schools, community care facilities, family day care homes, public facilities, private recreation facilities, and others that are determined to be

compatible with and oriented toward serving the needs of medium density neighborhoods may also be allowed.

High Density Residential (HDR); 25-43 du/ac – The High-Density Residential land use designation provides for the development of a wide range of living accommodations, including single-family dwelling units and multiple-family dwellings, such as townhomes, condominiums, apartments, and cooperatives. The designation allows a maximum of 43 dwelling units per net acre of land.

Uses such as religious facilities, public and private schools, community care facilities, family day care homes, public facilities, private recreation facilities, and others that are determined to be compatible with and oriented toward serving the needs of high-density neighborhoods may also be allowed.

Non-Residential Land Use Designations

Commercial (C); 1.0:1 Maximum FAR – The Commercial land use designation provides for a variety of retail, professional office, medical, service-oriented business activities, and hospitality facilities, many of which are roadway oriented and serve a community-wide area and population. The maximum intensity of development is a floor area ratio of 1.0:1.

Other uses that are determined to be compatible with the primary uses may also be allowed.

Professional Office (PO); 1.2:1 Maximum FAR – The Professional Office designation provides for professional offices and other supporting uses. These uses include, but are not limited to, professional, legal, medical, general financial, administrative, corporate, and general business offices, as well as supportive commercial uses such as restaurants, medical services, community facilities, and similar uses, which together create concentrations of office employment or community activity. Also included are small convenience or service commercial activities intended to meet the needs of the on-site employee population. The maximum intensity of development is a floor area ratio of 1.2:1.

Other uses that are determined to be compatible with the primary uses may also be allowed.

Business Park (BP); 1.0:1 Maximum FAR – The Business Park designation provides opportunities for a mixture of all those uses allowed under the Commercial, Professional Office, and Light Industrial land use designations. The maximum intensity of development is a floor area ratio of 1.0:1.

Light Industrial (LI); 0.60:1 Maximum FAR – The Light Industrial designation provides for a variety of light industrial uses that are nonpolluting and which can co-exist with surrounding land uses and which do not in their maintenance, assembly, manufacturing or operations create smoke, gas, dust, noise, vibration, soot or glare which might be obnoxious or offensive to persons residing or conducting business in the City. The maximum intensity of development is a floor area ratio of 0.6:1.

Allowable uses include wholesale businesses, light manufacturing and processing, research and development uses, warehousing and storage, distribution and sales, high technology production,

ancillary retail sales and related uses. Other uses that are determined to be compatible with the primary uses may also be allowed.

Public Facility (PF); 1.2:1 Maximum FAR – The Public Facility designation includes a wide range of public uses distributed throughout the community, such as schools, government offices and facilities, public utilities, libraries, fire stations, sheriff sub stations, cemeteries, hospitals, and other public uses. The maximum intensity of development is a floor area ratio of 1.2:1.

Mixed-Use Land Use Designations

Mixed-Use 32 (MU-32); 32 du/ac Maximum and 1.0:1 Maximum FAR – The Mixed-Use 32 designation provides opportunities for mixtures of commercial, office, and residential uses in the same building, on the same parcel of land, or within the same area.

Mixed-use areas offer opportunities for people to live, work, shop, and recreate without having to use their cars. This designation allows for vertical integration of compatible uses, whereby such uses share the same building or lot, or horizontal integration of uses, where compatible uses are located next to each other. Stand-alone residential projects are allowed, but they should be located in proximity to nonresidential development.

The maximum intensity of development is a floor area ratio of 1.0:1. A maximum density of 32 dwelling units per net acre of land is allowed for residential projects. For projects which include residential and nonresidential components, the density requirements shall apply to the residential component and the FAR shall apply to the nonresidential component.

Mixed-Use 43 (MU-43); 43 du/ac Maximum and 1.2:1 Maximum FAR – The Mixed-Use 43 designation provides opportunities for mixtures of commercial, office, and residential uses in the same building, on the same parcel of land, or within the same area.

Mixed-use areas offer opportunities for people to live, work, shop, and recreate without having to use their cars. This designation allows for vertical integration of compatible uses, whereby such uses share the same building or lot, or horizontal integration of uses, where compatible uses are located next to each other. Stand-alone residential projects are allowed but they should be located in proximity to nonresidential development. Vertical integration of uses is encouraged.

The maximum intensity of development is a floor area ratio of 1.2:1. A maximum density of 43 dwelling units per net acre of land is allowed for residential projects. For projects which include residential and nonresidential components, the density requirements shall apply to the residential component and the FAR shall apply to the nonresidential component.

Mixed-Use 60 (MU-60); 60 du/ac Maximum and 1.2:1 Maximum FAR – The Mixed-Use 60 designation provides opportunities for mixtures of commercial, office, and residential uses in the same building, on the same parcel of land, or within the same area.

Mixed-use areas offer opportunities for people to live, work, shop, and recreate without having to use their cars. This designation allows for vertical integration of compatible uses, whereby such uses share the same building or lot, or horizontal integration of uses, where compatible uses are

located next to each other. Stand-alone residential projects are allowed but they should be located in proximity to nonresidential development. High quality amenities, architecture, urban design, and open space are expected for projects near the maximum allowable density. Vertical integration of uses is strongly encouraged.

The maximum intensity of development is a floor area ratio of 2.0:1. A maximum density of 60 dwelling units per net acre of land is allowed for residential projects. For projects which include residential and nonresidential components, the density requirements shall apply to the residential component and the FAR shall apply to the nonresidential component.

Mixed-Use Office (MU-O); 1.5:1 Maximum FAR – Mixed-Use Office accommodates high-intensity business parks, office buildings, light manufacturing parks, and light industrial areas that provide for a variety of businesses that support office-oriented employment opportunities and services for Lake Forest and the region at intensities higher than those allowed in the Business Park or Professional Office designations. The maximum intensity of development is a floor area ratio of 1.5:1.

Additionally, uses that support businesses including, health and fitness centers, restaurants/cafés, convenience retail, and day care facilities would be conditionally allowed onsite as a minor use associated with a main employment generating use, hotel uses would also be allowed.

Urban Industrial 25 (UI-25); 25 du/ac Maximum and 1.0:1 Maximum FAR – The Urban Industrial designation provides for a mix of light industrial and commercial uses, including manufacturing and production of food, beverage, apparel, design, furniture, custom, or small run manufacturing. Live-work units and home-based businesses are envisioned to locate in this designation. The intent of this designation is to promote creation of a vibrant mixed-use environment with employment and living opportunities located in proximity. The maximum intensity of development is a floor area ratio of 1.0:1. A maximum density of 25 dwelling units per net acre of land is allowed for residential projects. For projects which include residential and nonresidential components, the density requirements shall apply to the residential component and the FAR shall apply to the nonresidential component.

Industrial or flexible building types are appropriate and should match the scale of adjacent uses. Flexible buildings allow one or more uses in a single facility, such as office space, research and development, showroom retail sales, light manufacturing research and development (R&D), and limited small warehouse and distribution uses along with residential development.

Urban Industrial 43 (UI-43); 43 du/ac Maximum and 1.2:1 Maximum FAR – The Urban Industrial designation provides for a mix of light industrial and commercial uses, including manufacturing and production of food, beverage, apparel, design, furniture, custom, or small run manufacturing. Live-work units and home-based businesses are envisioned to locate in this designation. The intent of this designation is to promote creation of a vibrant mixed-use environment with employment and living opportunities located in proximity. The maximum intensity of development is a floor area ratio of 1.2:1. A maximum density of 43 dwelling units per net acre of land is allowed for residential projects. For projects which include residential and nonresidential components, the

density requirements shall apply to the residential component and the FAR shall apply to the nonresidential component.

Industrial or flexible building types are appropriate and should match the scale of adjacent uses. Flexible buildings allow one or more uses in a single facility, such as office space, research and development, showroom retail sales, light manufacturing research and development (R&D), and limited small warehouse and distribution uses along with residential development.

Limited Development Land Use Designations

Community Park/Open Space (CP/OS); 0.40:1 Maximum FAR - The Community Park/Open Space designation provides for public recreational uses designed to meet the active and passive recreational needs of the community. This designation allows public parkland, open space, and associated public recreational facilities, such as indoor and outdoor sports/athletic facilities, museums, theaters, and similar uses. The maximum intensity of development is a floor area ratio of 0.4:1.

Regional Park/Open Space (RP/OS); 0.10:1 Maximum FAR - The Regional Park/Open Space designation provides for public recreational uses designed to meet the active and passive recreational needs of the community and other nearby areas in the region. This designation includes the Whiting Ranch Regional Wilderness Park and other County of Orange open space along portions of Serrano Creek and Aliso Creek. This designation applies to land that is generally maintained as natural open space with minimal improvements. The maximum intensity of development is a floor area ratio of 0.1:1.

Open Space (OS); 0.40:1 Maximum FAR – The Open Space designation provides for private open space designed to meet the active and passive recreational needs of the community. This designation includes open space that is held under private ownership, and includes facilities for active and passive recreational activities. Open Space facilities include indoor and outdoor sports/athletic facilities, lakes, club houses, meeting rooms, outdoor gathering areas, and similar uses, as well as ornamentally landscaped and natural landscaped open areas. The maximum intensity of development is a floor area ratio of 0.4:1.

Lake (L) – The Lake designation provides for lakes as well as ornamentally landscaped and natural landscaped open areas associated with lake facilities. No development is expected in this area.

Transportation Corridor (TC) – The Transportation Corridor designation applies to the land within the corridor of the Southern California Regional Rail Authority. Land within this corridor is reserved for rail transportation purposes as the primary use. Secondary uses, such as open space linkages and landscape areas, public and private parking areas, and other transportation related activities and facilities are also allowed. No development is expected in this area.

TABLE 2.0-1: ACREAGE BY LAND USE DESIGNATION IN THE PROPOSED LAND USE MAP

LAND USE DESIGNATION	*TOTAL ACRES*
RESIDENTIAL LAND USES	
Very Low Density Residential	0
Low Density Residential	2,499
Low-Medium Density Residential	880
Medium Density Residential	361
High Density Residential	16
Residential Subtotal	*3,756*
NON-RESIDENTIAL LAND USES	
Commercial	280
Professional Office	8
Business Park	298
Light Industrial	627
Public Facility	373
Non-Residential Subtotal	*1,586*
MIXED-USE LAND USES	
Mixed-Use 32	101
Mixed-Use 43	295
Mixed-Use 60	68
Mixed-Use Office	24
Urban Industrial 25	52
Urban Industrial 43	26
Mixed-Use Subtotal	*566*
LIMITED DEVELOPMENT LAND USES	
Community Park/Open Space	249
Regional Park/Open Space	1,939
Open Space	877
Lake	58
Transportation Corridor	30
Right-of-Way	1,681
Limited Development Subtotal	*4,834*
Totals	**10,742**

SOURCE: DE NOVO PLANNING GROUP, 2019

2.5 GENERAL PLAN BUILDOUT ANALYSIS

The EIR evaluates the anticipated development that could occur within the Planning Area if every parcel in the city developed at the densities and intensities expected under the proposed General Plan. While no specific development projects are proposed as part of the General Plan Update, the General Plan will accommodate future growth in Lake Forest, including new businesses, expansion of existing businesses, and new residential uses. The buildout analysis utilizes a 20-year horizon, and 2040 is assumed to be the buildout year of the General Plan.

Table 2.0-2 includes a comparison of existing conditions, the current General Plan Land Use Map, and the proposed General Plan Land Use Map in terms of population, housing units, nonresidential development square footage, jobs, and the jobs-to-housing ratio (August 2019).

TABLE 2.0-2: COMPARATIVE GROWTH PROJECTIONS, CURRENT GENERAL PLAN LAND USE MAP AND DRAFT LAND USE MAP

	HOUSING UNITS	*POPULATION*	*NONRESIDENTIAL SQUARE FOOTAGE*	*JOBS*	*JOBS PER HOUSING UNIT*
EXISTING CONDITIONS (8/1/19)					
Planning Area	28,928	81,888	15,315,700	38,039	1.31
BUILDOUT CONDITIONS: PLANNING AREA					
Current General Plan	36,700	108,998	26,077,229	48,209	1.31
Draft Land Use Map	51,334	152,462	27,726,585	52,241	1.02
NEW GROWTH: PLANNING AREA					
Over Existing Conditions	22,406	70,574	12,410,885	14,202	-
Over Current General Plan	14,634	43,464	1,649,356	4,032	-

SOURCE: DE NOVO PLANNING GROUP, 2019

State General Plan law requires that the General Plan indicate the maximum densities and intensities permitted within the Land Use Plan. Maximum allowable development on individual parcels of land is governed by these measures of density or intensity. The Land Use Element of the Lake Forest General Plan and Appendix B to this EIR identify the effective overall level of development within each land use designation within the City. These effective levels of development represent an anticipated overall density and intensity of development for Lake Forest and are, therefore, less than the absolute maximum allowed for an individual parcel of land. For various reasons, many parcels in the community have not been developed to their maximum density or intensity and, in the future, maximum development can be expected to occur only on a limited number of parcels.

Development at an intensity or density between the expected and maximum levels is expected to occur when projects offer exceptional design quality, important public amenities or benefits, or other factors that promote important goals and policies of the General Plan. A variety of other plans and programs further restrict the development potential of a given site, including Development Agreements, development standards, Planned Community requirements, minimum parking ratios, and other similar mechanisms which can result in parcels developing at densities and intensities lower than those identified in the General Plan and analyzed in this EIR.

Consistent with the draft General Plan Land Use Map, future growth would be focused in the five focus areas identified by the community and approved for analysis by the City Council. As shown in Table 2.0-2, buildout of the General Plan could yield a total of up to 51,334 housing units, a population of 152,462 people, 27,726,585 square feet of non-residential building square footage, and 52,241 jobs within the Planning Area. As shown in Table 2.0-2, this represents development

growth over existing conditions of up to 22,406 new housing units, 70,574 people, 12,410,885 square feet of new non-residential building square footage and 14,202 jobs. [1]

Table 2.0-3 breaks down the Planning Area Buildout Potential by General Plan Land Use Designation, including acres assigned to each land use and associated housing units, population growth, non-residential building square footage, and jobs at buildout. Table 2.0-4 quantifies how the Planning Area Buildout Potential for the General Plan Update compares to the Planning Area Buildout Potential under the City's Current General Plan.

TABLE 2.0-3: PLANNING AREA BUILDOUT POTENTIAL

LAND USE DESIGNATION	TOTAL ACRES	HOUSING UNITS AT BUILDOUT	POPULATION GROWTH AT BUILDOUT	NON-RESIDENTIAL BUILDING SQUARE FOOTAGE AT BUILDOUT	JOBS AT BUILDOUT
RESIDENTIAL LAND USES					
Very Low Density Residential	-	-	-	-	-
Low Density Residential	2,499	17,023	50,559	-	-
Low-Medium Density Residential	880	9,589	28,481	-	-
Medium Density Residential	361	7,931	23,555	-	-
High Density Residential	16	620	1,840	-	-
Residential Subtotal	*3,756*	*35,163*	*104,435*	-	-
NON-RESIDENTIAL LAND USES					
Commercial	280	-	-	3,054,326	6,787
Professional Office	8	-	-	110,398	368
Business Park	298	-	-	4,545,819	7,576
Light Industrial	627	-	-	9,565,602	15,943
Public Facility	373	-	-	811,508	812
Non-Residential Subtotal	*1,586*	-	-	*18,087,653*	*31,486*
MIXED-USE LAND USES					
Mixed-Use 32	101	3,234	9,605	1,100,607	2,446
Mixed-Use 43	295	7,567	22,473	5,133,082	11,407
Mixed-Use 60	68	3,265	9,696	1,481,288	3,292
Mixed-Use Office	24	-	-	513,715	1,284
Urban Industrial 25	52	1,155	3,430	914,637	1,524
Urban Industrial 43	26	950	2,823	460,007	767
Mixed-Use Subtotal	*566*	*16,171*	*48,027*	*9,603,336*	*20,720*
LIMITED DEVELOPMENT LAND USES					
Community Park/Open Space	249	-	-	27,148	27
Regional Park/Open Space	1,939	-	-	8,448	8
Open Space	877	-	-	-	-
Lake	58	-	-	-	-
Transportation Corridor	30	-	-	-	-
Right-of-Way	1,681	-	-		
Limited Development Subtotal	*4,834*	-	-	*35,596*	*36*

[1] Assumptions regarding expected densities, intensities, land use mixes, persons per household, and employment density are included as Appendix B.

LAND USE DESIGNATION	TOTAL ACRES	HOUSING UNITS AT BUILDOUT	POPULATION GROWTH AT BUILDOUT	NON-RESIDENTIAL BUILDING SQUARE FOOTAGE AT BUILDOUT	JOBS AT BUILDOUT
Totals	**10,742**	**51,334**	**152,462**	**27,726,585**	**52,242**

SOURCE: DE NOVO PLANNING GROUP, 2019

TABLE 2.0-4: POTENTIAL NEW GROWTH IN PLANNING AREA OVER CURRENT GENERAL PLAN

LAND USE DESIGNATION	TOTAL ACRES	NEW HOUSING UNITS AT BUILDOUT	NEW POPULATION GROWTH AT BUILDOUT	NEW NON-RESIDENTIAL BUILDING SQUARE FOOTAGE AT BUILDOUT	NEW JOBS AT BUILDOUT
RESIDENTIAL LAND USES					
Very Low Density Residential	-	-	-	-	-
Low Density Residential	2,499	795	2,361	-	-
Low-Medium Density Residential	880	(594)	(1,763)	-	-
Medium Density Residential	361	(642)	(1,907)	-	-
High Density Residential	16	-	-	-	-
Residential Subtotal	*3,756*	*(441)*	*(1,309)*	-	-
NON-RESIDENTIAL LAND USES					
Commercial	280	-	-	(3,066,453)	(6,814)
Professional Office	8	-	-	(278,837)	(929)
Business Park	298	-	-	753,004	1,255
Light Industrial	627	-	-	(1,581,695)	(2,636)
Public Facility	373	-	-	0	0
Non-Residential Subtotal	*1,586*	-	-	*(4,173,981)*	*(9,124)*
MIXED-USE LAND USES					
Mixed-Use 32	101	3,234	9,605	1,100,607	2,446
Mixed-Use 43	295	6,471	19,219	2,859,973	6,355
Mixed-Use 60	68	3,265	9,696	1,481,288	3,292
Mixed-Use Office	24	-	-	513,715	1,284
Urban Industrial 25	52	1,155	3,430	914,637	1,524
Urban Industrial 43	26	950	2,823	460,007	767
Mixed-Use Subtotal	*566*	*15,075*	*44,773*	*7,330,227*	*15,668*
LIMITED DEVELOPMENT LAND USES					
Community Park/Open Space	249	-	-	(882)	(1)
Regional Park/Open Space	1,939	-	-		
Open Space	877	-	-	-	-
Lake	58	-	-	-	-
Transportation Corridor	30	-	-	-	-
Right-of-Way	1,681				
Limited Development Subtotal	*4,834*			*(882)*	*(1)*
Totals	**10,742**	**14,634**	**43,464**	**3,155,364**	**6,543**

SOURCE: DE NOVO PLANNING GROUP, 2019

2.6 USES OF THE EIR AND REQUIRED AGENCY APPROVALS

This EIR may be used for the following direct and indirect approvals and permits associated with adoption and implementation of the proposed project.

CITY OF LAKE FOREST

The City of Lake Forest is the lead agency for the proposed project. The updated Lake Forest General Plan will be presented to the Planning Commission for review and recommendation and to the City Council for comment, review, and consideration for adoption. The City Council has the sole discretionary authority to approve and adopt the Lake Forest General Plan. In order to approve the proposed project, the City Council would consider the following actions:

- Certification of the General Plan EIR;
- Adoption of required CEQA findings and Statement of Overriding Considerations for the above action;
- Adoption of a Mitigation Monitoring and Reporting Program; and
- Approval of the General Plan Update.

SUBSEQUENT USE OF THE EIR

This EIR provides a review of environmental effects associated with implementation of the proposed General Plan. When considering approval of subsequent activities under the proposed General Plan, the City of Lake Forest would utilize this EIR as the basis in determining potential environmental effects and the appropriate level of environmental review, if any, of a subsequent activity. Projects or activities successive to this EIR may include, but are not limited to, the following:

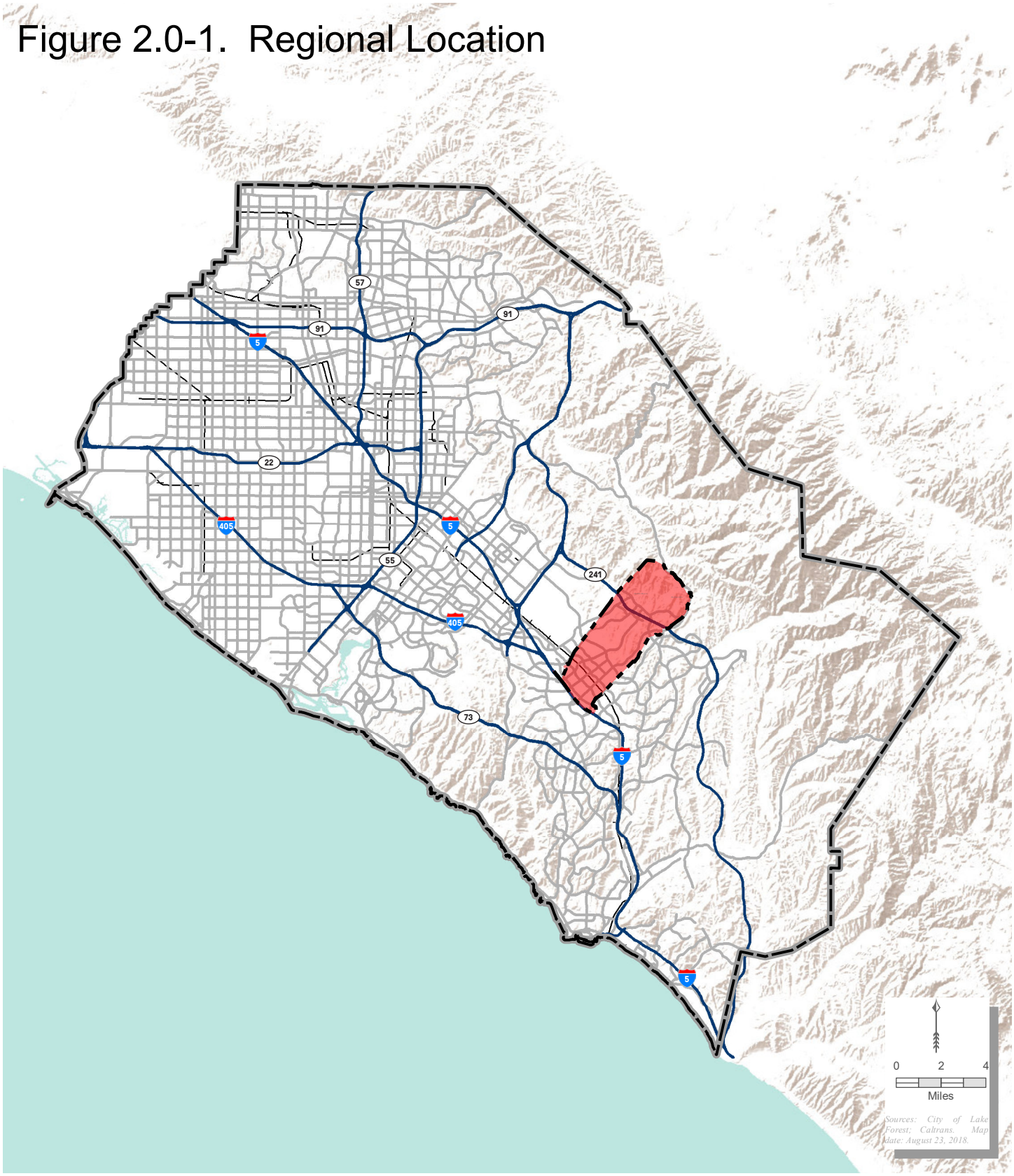
- Approval and funding of major projects and capital improvements;
- Future Specific Plan, Planned Unit Development, or Master Plan approvals;
- Revisions to the Lake Forest Zoning Ordinance;
- Development plan approvals, such as tentative subdivision maps, variances, conditional use permits, and other land use permits;
- Development Agreements;
- Property rezoning consistent with the General Plan;
- Permit issuances and other approvals necessary for public and private development projects; and
- Issuance of permits and other approvals necessary for implementation of the General Plan.

OTHER GOVERNMENTAL AGENCY APPROVALS

City approval of the proposed project would not require any actions or approvals by other public agencies. Subsequent projects and other actions to support implementation of the proposed project would require actions, including permits and approvals, by other public agencies that may include, but are not necessarily limited to:

- California Department of Fish and Wildlife (CDFW) approval of potential future streambed alteration agreements, pursuant to Fish and Game Code. Approval of any future potential take of State-listed wildlife and plant species covered under the California Endangered Species Act.
- California Department of Transportation (Caltrans) approval of projects and encroachment permits for projects affecting State highway facilities.
- Regional Water Quality Control Board (RWQCB) approval for National Pollution Discharge Elimination System compliance, including permits and Storm Water Pollution Prevention Plan approval and monitoring.
- U.S. Fish and Wildlife Service (USFWS) approvals involving any future potential take of Federally listed wildlife and plant species and their habitats, pursuant to the Federal Endangered Species Act.

Figure 2.0-1. Regional Location



Legend

Orange County

City of Lake Forest

Our Vision. Our Plan. Lake Forest 2040

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Figure 2.0-2 Planning Boundaries

Legend

City of Lake Forest

Lake Forest 2040
Our Vision. Our Plan.

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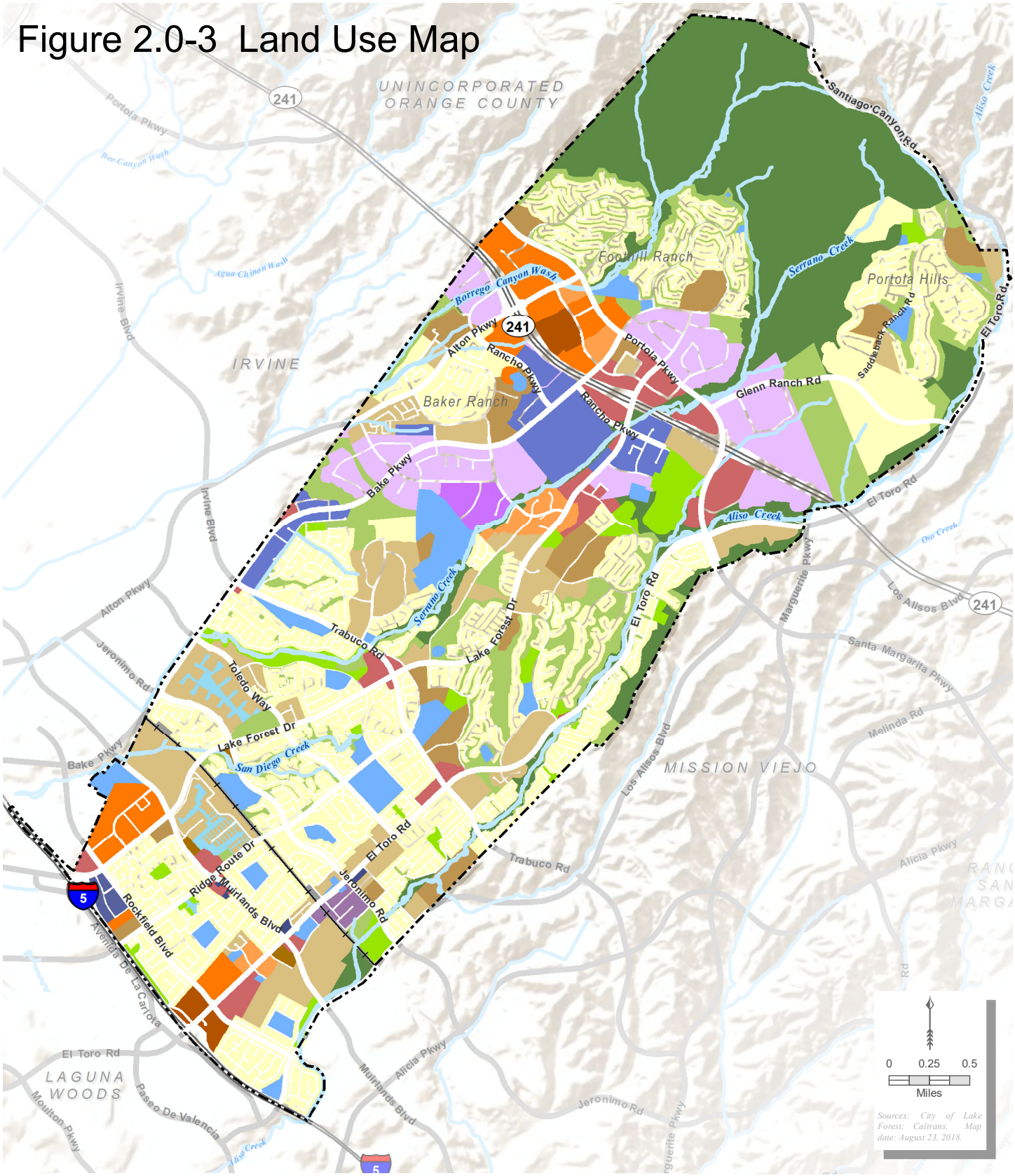
Figure 2.0-3 Land Use Map



Legend

- LOW DENSITY RESIDENTIAL
- LOW-MEDIUM DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- MIXED-USE 32
- MIXED-USE 43
- MIXED-USE 60
- BUSINESS PARK
- MIXED-USE - OFFICE
- PROFESSIONAL OFFICE
- LIGHT INDUSTRIAL
- URBAN INDUSTRIAL 25
- URBAN INDUSTRIAL 43
- PUBLIC FACILITY
- COMMUNITY PARK/OPEN SPACE
- REGIONAL PARK/OPEN SPACE
- OPEN SPACE
- LAKE
- TRANSPORTATION CORRIDOR

Our Vision. Our Plan. Lake Forest 2040

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The City of Lake Forest possesses numerous scenic resources, and there are also many scenic resources within the unincorporated areas of Orange County. These resources enhance the quality of life for Lake Forest residents, and provide for numerous outdoor recreational uses. Landscapes can be defined as a combination of four visual elements: landforms, water, vegetation, and man-made structures. Scenic resource quality is an assessment of the uniqueness or desirability of a visual element.

This section was prepared based on existing reports and literature for Lake Forest and the surrounding areas in Orange County. Additional sources of information included the California Department of Transportation's (Caltrans) Designated Scenic Route map for Orange County. A reconnaissance-level visual resource survey of the Planning Area was conducted in 2018.

This section provides a background discussion of the scenic highways and corridors, and natural scenic resources such as creeks, wildlife areas, and prominent visual features found in the Lake Forest Planning Area. This section is organized with an existing setting, regulatory setting, and impact analysis.

There were no comments received during the NOP comment period related to this environmental topic.

CONCEPTS AND TERMINOLOGY

The aesthetic value of an area is a measure of its visual character and quality, combined with the viewer response to the area. Scenic quality can best be described as the overall impression that an individual viewer retains after driving through, walking through, or flying over an area. Viewer response is a combination of viewer exposure and viewer sensitivity. Viewer exposure is a function of the number of viewers, number of views seen, distance of the viewers, and viewing duration. Viewer sensitivity relates to the extent of the public's concern for a particular viewshed. These terms and criteria are described in detail below.

Visual Character. Natural and artificial landscape features contribute to the visual character of an area or view. Visual character is influenced by geologic, hydrologic, botanical, wildlife, recreational, and urban features. Urban features include those associated with landscape settlements and development, including roads, utilities, structures, earthworks, and the results of other human activities. The perception of visual character can vary significantly seasonally, even hourly, as weather, light, shadow, and elements that compose the viewshed change. The basic components used to describe visual character for most visual assessments are the elements of form, line, color, and texture of the landscape features. The appearance of the landscape is described in terms of the dominance of each of these components.

Visual Quality. Visual quality is evaluated using the well-established approach to visual analysis adopted by the Federal Highway Administration, employing the concepts of vividness, intactness, and unity, which are described below.

- Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.
- Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, and in natural settings.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the landscape.

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity, as modified by visual sensitivity. High-quality views are highly vivid, relatively intact, and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

Viewer Exposure and Sensitivity. The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity or concern is based on the visibility of resources in the landscape, proximity of viewers to the visual resource, elevation of viewers relative to the visual resource, frequency and duration of views, number of viewers, and type and expectations of individuals and viewer groups.

The importance of a view is related, in part, to the position of the viewer to the resource; therefore, visibility and visual dominance of landscape elements depend on their placement within the viewshed. A viewshed is defined as all of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway or trail). To identify the importance of views of a resource, a viewshed must be broken into distance zones of foreground, middle ground, and background. Generally, the closer a resource is to the viewer, the more dominant it is and the greater its importance to the viewer. Although distance zones in a viewshed may vary between different geographic region or types of terrain, the standard foreground zone is 0.25–0.5 mile from the viewer, the middle ground zone is from the foreground zone to 3–5 miles from the viewer, and the background zone is from the middle ground to infinity.

Visual sensitivity depends on the number and type of viewers and the frequency and duration of views. Visual sensitivity is also modified by viewer activity, awareness, and visual expectations in relation to the number of viewers and viewing duration. For example, visual sensitivity is generally higher for views seen by people who are driving for pleasure, people engaging in recreational activities such as hiking, biking, or camping, and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work. Commuters and non-recreational travelers have generally fleeting views and tend to focus on commute traffic, not on surrounding scenery; therefore, they are generally considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; therefore, they are generally considered to have high visual sensitivity. Viewers using recreation trails and areas, scenic highways, and scenic overlooks are usually assessed as having high visual sensitivity.

Judgments of visual quality and viewer response must be made based on a regional frame of reference. The same landform or visual resource appearing in different geographic areas could have a different degree of visual quality and sensitivity in each setting. For example, a small hill may be a significant visual element on a flat landscape but have very little significance in mountainous terrain.

Scenic Highway Corridor. The area outside of a highway right-of-way that is generally visible to persons traveling on the highway.

Scenic Highway/Scenic Route. A highway, road, drive, or street that, in addition to its transportation function, provides opportunities for the enjoyment of natural and human-made scenic resources and access or direct views to areas or scenes of exceptional beauty (including those of historic or cultural interest). The aesthetic values of scenic routes often are protected and enhanced by regulations governing the development of property or the placement of outdoor advertising. Until the mid-1980's, general plans in California were required to include a Scenic Highways Element.

View Corridor. A view corridor is a highway, road, trail, or other linear feature that offers travelers a vista of scenic areas within a city or county.

3.1.1 ENVIRONMENTAL SETTING

NATURAL ENVIRONMENT

The City of Lake Forest is surrounded by the City of Irvine to the west; Whiting Ranch Wilderness Park and an unincorporated area of Orange County to the north; the City of Mission Viejo to the east and south; and the Cities of Laguna Hills and Laguna Woods to the south. Terrain in the City of Lake Forest ranges from the Saddleback Valley in the southern part of the City, to low hills in the north that lead up to the foothills of the Santa Ana Mountains further north of the City. Much of the City of Lake Forest has a gentle southwest slope, with elevations ranging from approximately 300 feet above mean sea level (amsl) at the southwestern corner of the City to approximately 1,500 feet amsl at the northern end of the City.

The most significant visual features outside the Lake Forest Planning Area are the Saddleback mountains just to the northeast, the most prominent landmark being Santiago Peak at 5,687 feet above mean sea level. Views of the mountains are available from most parts of Lake Forest and are one its most notable visual assets.

Lake Forest has several prominent creeks, including Aliso Creek, Serrano Creek, San Diego Creek, and the Borrego Canyon Wash.

Lake Forest derives its name from its lakes and Eucalyptus forest. While both of the two lakes and the Eucalyptus forest are manmade, they have been an integral part of Lake Forest's identity and continue to draw residents to the area. The lakes and Eucalyptus groves are an important visual resource to the community.

BUILT ENVIRONMENT

Residential, commercial, and industrial land uses along with the open spaces surrounding the City largely define the visual character of Lake Forest. While Native American settlements in Lake Forest have been around since before the colonial era, the visual impact of settlement is largely a result of post 1850s development. Following the cession of California to the United States after the Mexican-American War, a stagecoach route passed through the El Toro as early as the late 1850s and a stagecoach stop was established just south of El Toro (Fox, 1939). The land was eventually subdivided. Settlers raised cattle and sheep and planted vineyards and fruit trees. By 1886 the majority of the Saddleback Valley was planted in grapes, until plant disease called the "Anaheim Disease" decimated the vineyards. Orange and walnuts trees soon replaced the failed vineyards (Irons, 1976). The area grew further still when in 1887, the San Bernardino and San Diego Railway Co. built rail lines through the area, thus founding the town of Aliso City (Irons, 1976). The railroad "boom" brought an influx of people into southern California and numerous cities were proposed. On paper, many of these cities were absorbed by larger ones, while most, like Aliso City, remained small towns (Osterman, 1992). Whiting established a 400 acre of dense Eucalyptus tree forest located between present day Ridge Route, Jeronimo, Lake Forest and Serrano Road. The Eucalyptus is now a ubiquitous characteristic of the present-day Lake Forest, the city's name originating from Whiting's man-made forest (Irons, 1976). Early growth was concentrated near the railroad as evidenced by the higher median age of homes and the presence of mature trees and landscaping. As the city expanded, the street patterns developed following the City's topography with major streets running parallel and perpendicular to the rail road tracks.

Lake Forest's visual character was also largely influenced by neighboring land uses. From the 1940s until the late 1990s, the Marine Corps Air Station in El Toro lay immediately adjacent to the City of Lake Forest. Due to noise and safety restrictions related to the base, large swaths of Lake Forest were either zoned for industrial development, or remained undeveloped altogether. Once the base was decommissioned, however, the City of Lake Forest was able to rezone much of the land in the former flight path for residential uses. From 2008-2012, the City Council approved of 7 new residential communities. These master planned communities built upon the existing Lake Forest aesthetic, with distinctive homes and parks, and enhancing the City's natural connection to the surrounding environment through the expansion and preservation of trails and open space. At this time, a new sports park was built and substantial roadway improvements were made—all of which contribute to the visual aesthetic of the City.

Lake Forest does not have a traditional downtown, but rather has a number of commercial centers including development along El Toro Road and the Town Center along Portola Parkway with other smaller commercial nodes throughout the City.

SCENIC HIGHWAYS AND CORRIDORS

According to the California Scenic Highway Mapping System, administered by Caltrans, there are no officially designated State Scenic Highways in the vicinity of Lake Forest (Caltrans, 2017). There is only one officially designated scenic highway corridor in Orange County: a small portion of the CA-91, running through Anaheim Hills from the Intersection of the CA-91 and CA-55 to the portion

of the CA-91 adjacent to the Yorba Regional Park (Caltrans, 2017). However, this officially designated scenic highway corridor does not provide views of Lake Forest or the immediate surrounding areas, and there are no sections of highway in the Lake Forest vicinity eligible for Scenic Highway designation.

LIGHT AND GLARE

During the day, sunlight reflecting from structures is a primary source of glare, while nighttime light and glare can be divided into both stationary and mobile sources. Stationary sources of nighttime light include structure illumination, interior lighting, decorative landscape lighting, and streetlights. The principal mobile source of nighttime light and glare is vehicle headlamp illumination. This ambient light environment can be accentuated during periods of low clouds or fog.

The variety of urban land uses in the Planning Area are the main source of daytime and nighttime light and glare. They are typified by single and multi-family residences, commercial structures, industrial areas, and streetlights. These areas and their associated human activities (inclusive of vehicular traffic) characterize the existing light and glare environment present during daytime and nighttime hours in the urbanized portions of the Planning Area. Areas to the northeast outside of the city limits, near the fringes of the Planning Area are characterized primarily by open space uses and lower intensity residential development, and generally have lower levels of ambient nighttime lighting and daytime glare. However, areas along I-5 at the City's southern boundary as well as the City's eastern boundary generally have more sources of glare.

Sources of glare in urbanized portions of the Planning Area come from light reflecting off surfaces, including glass, and certain siding and paving materials, as well as metal roofing. The urbanized areas of Lake Forest contain sidewalks and paved parking areas which reflect street and vehicle lights. The existing light environment found in the project area is considered typical of suburban areas.

Sky glow is the effect created by light reflecting into the night sky. Sky glow is of particular concern in areas surrounding observatories, where darker night sky conditions are necessary, but is also of concern in more rural or natural areas where a darker night sky is either the norm or is important to wildlife. Due to the urban nature of the city limits, a number of existing light sources affect residential areas and illuminate the night sky. Isolating impacts of particular sources of light or glare is therefore not appropriate or feasible for the project.

3.1.2 REGULATORY SETTING

FEDERAL

There are no Federal regulations that apply to the proposed project related to visual resources in the study area.

STATE

California Department of Transportation – California Scenic Highway Program

California's Scenic Highway Program was created by the Legislature in 1963 to preserve and protect scenic highway corridors from change, which would diminish the aesthetic value of lands adjacent to highways. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Section 260 et seq.

The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code. A list of California's scenic highways and map showing their locations may be obtained from the Caltrans Scenic Highway Coordinators.

If a route is not included on a list of highways eligible for scenic highway designation in the Streets and Highways Code Section 263 et seq., it must be added before it can be considered for official designation. A highway may be designated scenic depending on the extent of the natural landscape that can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

When a local jurisdiction nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. A scenic corridor is the land generally adjacent to and visible from the highway. A scenic highway designation protects the scenic values of an area. Jurisdictional boundaries of the nominating agency are also considered, and the agency must also adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program.

To receive official designation, the local jurisdiction must follow the same process required for official designation of State Scenic Highways. The minimum requirements for scenic corridor protection include:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising (including a ban on billboards);
- Careful attention to and control of earthmoving and landscaping; and
- Careful attention to design and appearance of structures and equipment.

LOCAL

City of Lake Forest Citywide Design Guidelines

The Lake Forest Citywide Design Guidelines are an outgrowth of the goals and policies found in the current Land Use Element of the General Plan. Design guidelines are intended to supplement the development standards found in the Zoning Ordinance and applicable Planned Community texts. Design guidelines are more generalized statements, alternatives or illustrations of what is expected and encouraged. Furthermore, they facilitate the development review process by better defining expectations and providing direction on issues not typically covered by the development standards, such as building orientation, architectural styles, or building materials. The common objective of design guidelines is to ensure that proposed development is constructed in an aesthetically-pleasing and high-quality manner that is within the character of the community. Communities with design guidelines have reaped many benefits over time, as developments have been distinct in quality.

El Toro Redevelopment Project Area Design Guidelines

These guidelines establish the basic standards for site design, architecture, landscape, and signage components for all development within the Lake Forest Redevelopment Project Area in the City of Lake Forest. These guidelines do not apply to single family development or development in the area commonly known as the Light Industrial Area (El Toro Planned community). However, in any case where the guidelines are not mandatory, a property owner may elect to voluntarily adhere to the provisions that apply to his/her development.

Light Industrial Area Design Guidelines

The Light Industrial Design Guidelines are intended to serve as a point of reference to guide property owners, business owners, developers, architects, and other design professionals in understanding the objective of providing for well-designed, attractive, high quality industrial development in the Light Industrial Area (LIA). The LIA is contained within the City's El Toro Redevelopment Project Area and consists of 27 acres of light industrial, service commercial, and professional office development straddling the railroad tracks. The LIA is generally bound by El Toro Road to the north, Jeronimo Road to the east, Cherry Avenue to the south, and Front Street/Whisler Drive on the west. Development standards and permitted uses for the LIA are listed within the El Toro Planned Community and the City's Zoning Ordinance. The Design Guidelines are intended to complement the two regulatory documents and will be used by the City to evaluate the design of industrial development in the LIA. The guidelines focus on industrial development only. Projects which are more retail commercial or office in nature should follow the applicable guidelines in the El Toro Redevelopment Project Area Design Guidelines.

3.1.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on aesthetics if it will:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality;
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

IMPACTS AND MITIGATION MEASURES

Impact 3.1-1: General Plan implementation would not have a substantial adverse effect on a scenic vista (Less than Significant)

While the Lake Forest Planning Area contains numerous areas and viewsheds with relatively high scenic value, there are no officially designated scenic vista points in the Planning Area. Additionally, as described above, there are no officially designated scenic highways located in the vicinity of Lake Forest. Significant visual resources in the Planning Area include several prominent creeks, including Aliso Creek, Serrano Creek, San Diego Creek, and the Borrego Canyon Wash, and the Eucalyptus groves that surround portions of the these lakes. Other prominent visual features throughout the Planning area include views of ridgelines, hillsides, and canyons.

The most significant visual features outside the Lake Forest Planning Area are the Saddleback mountains just to the northeast, the most prominent landmark being Santiago Peak at 5,687 feet above mean sea level. Views of the mountains are available from most parts of Lake Forest and are one its most notable visual assets.

There are very few areas within the City of Lake Forest that are designated for urban land uses which are not already developed. Existing areas within the City that are undeveloped and in a naturalized condition are designated for open space uses by both the existing and proposed General Plan Land Use Maps. The proposed Land Use Map does not convert any open space lands to urban uses.

However, as noted in greater detail in the Project Description chapter (chapter 2.0), implementation of the proposed General Plan could lead to new and expanded urban and suburban development throughout the City. This new development may result in changes to the skyline throughout the Planning Area, which may obstruct or interfere with views of visual features surrounding the Planning Area, including views of Santiago Peak.

Furthermore, buildout under the proposed General Plan and implementation of the General Plan Land Use Map has the potential to result in new and expanded development along highway corridors with high scenic values, even though these corridors are not officially designated as State Scenic Highways. Additionally, expanded development could occur alongside roadways within the City of Lake Forest considered landscape corridors by the Orange County General Plan, which include El Toro Road and a portion of Santa Margarita Parkway. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

Future development would be required to be consistent with the proposed General Plan. A central theme of the General Plan is to preserve and protect the City's natural resources and scenic resources. This is expressed in Policy RR-2.3, which seeks to protect the City's scenic resources to the extent practical. Policy RR-2.4 promotes conservation education to protect the City's natural resources. Other policies promote open space within the Planning Area, such as Policy RR-2.1, which calls for the maintenance of the existing open space within the City, and Policy RR-2.2, which promotes the coordination among regional actors to preserve open space areas that overlap with neighboring jurisdictions. Policy RR-1.9 seeks to protect new parks and recreational development with sustainable landscaping. Other policies promote visually-appropriate on-site amenities, as provided in Policy LU-5.8, and design and maintenance standards for City amenities, as described under Policy RR-1.4. Moreover, other policies promote the installation of specific visual features, such as Policy LU-4.6 (street trees) and Policy LU-4.7 (medians), and design integration between buildings, a described by Policy LU-5.7. Other policies are directed more generally at integrating land uses and visual quality between land uses, such as Policy LU-4.1 (major corridors), Policy LU-4.2 (walkability), Policy LU-4.3 (building massing), Policy LU-4.4 (building footprint), and Policy LU-4.5 (connectivity).

The Lake Forest General Plan has been developed to preserve expansive areas of open space and to ensure that new development is located in and around existing urbanized areas, thus ensuring that new development is primarily an extension of the existing urban landscape, and minimizes interruption of views of nearby visual features.

In addition to the goals and policies identified above that provide protection for open space resources and visually prominent resources in the Planning Area, a range of policies and actions contained in the Land Use Element are intended to maintain and enhance the overall visual character of the Planning Area, and to avoid the installation of structures or features that conflict with the character of the surrounding area. Policies LU-2.1, LU-2.4, LU-2.7 seek to ensure that new development fits within the existing community setting and is compatible with surrounding uses. Policies LU-2.3, LU-2.6, LU-4.4 support the preservation and protection of the City's existing neighborhoods. Policy LU-2.9 seeks to maintain homes, structures, and property at high standards, which include visual quality. Policies LU-3.1, LU-3.2, LU-3.3, and LU-3.4 seek to promote the City visually through design and physical features. Policy LU-3.5 promotes revitalization of existing buildings to enhance their visual quality. Further, Policies LU-3.7, LU-3.8, LU-3.9, LU-4.1, LU-4.6, LU-5.7, LU-5.8, and RR-1.9 promote visually attractive public spaces and other public features.

The implementation of the policies and actions contained in the General Plan listed below would ensure that new urban residential and non-residential development in the Lake Forest Planning Area is located in and around existing urbanized areas and developed to be visually compatible with nearby open space resources. Additionally, the implementation of the policies and actions contained in the Land Use Element would further ensure that new development is designed in a way that enhances the visual quality of the community, compliments the visual character of the city, and that adverse effects on public views are minimized. Therefore, the impact would be **less than** significant following implementation of the policies and actions listed below.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

LU-2.1: Physical Characteristic Compatibility. Ensure that new development fits within the existing community setting and is compatible with surrounding land uses and public infrastructure availability.

LU-2.3: Existing Residential Neighborhoods. Preserve, protect, and enhance the City's existing residential neighborhoods.

LU-2.4: Scale and Character. Ensure that the scale and character of new development is appropriate to the setting and intended use.

LU-2.5: Visual Compatibility. Require new development projects achieve visual compatibility with surrounding development through building, site, or design techniques, such as landscaping and architectural design, to achieve visual compatibility.

LU-2.6: Commercial Development. Ensure that commercial uses are built and operated in such a way as to complement, but not conflict with, adjacent sensitive uses.

LU-2.7: Interface with Residential Areas. Promote compatibility of adjacent land uses along the interface of different residential density and non-residential intensity categories by paying special attention to buffers and transitional areas.

LU-2.9: Code Enforcement. Require property owners to maintain homes, structures, and property in good condition; continue code enforcement activities that address nuisances that detract from the City's health, safety, and community image.

LU-3.1: Branding. Enhance the city's identity through the use of distinct city graphics in the design of gateways, street signs, city signage, public facilities and public gathering spaces, and other areas where appropriate.

LU-3.2: Sense of Arrival. Highlight major arrival and departure points along the community's edge by encouraging distinctive building design elements, streetscapes, decorative signage, landscaping, and/or other enhancements at strategic gateway locations.

LU-3.3: Physical Attributes. Maintain the physical attributes of Lake Forest, such as its streetscapes, parks, trails, and scenic vistas, to preserve an identifiable and distinct community within Orange County.

LU-3.4: High-Quality Design. Promote high-quality design for all public and private development projects, including building form, site design, landscaping, lighting, signage, and other components which impact the visual quality of a project.

LU-3.5: Nonresidential Area Revitalization. Promote rehabilitation of older commercial and industrial properties and buildings to enhance their quality and competitive advantage.

LU-3.6: Architectural Styles. Promote architectural styles that emphasize the established community identity while allowing for the introduction of other appealing architectural design strategies that are compatible with their surroundings.

LU-3.7: Public Gathering Spaces. Encourage the provision of both formal and informal public gathering spaces through pedestrian-oriented street design; sidewalk furniture and pedestrian-oriented development; well-designed, multi-use public spaces of different sizes including pocket parks, plazas, and monuments; and community events.

LU-3.8: Public Art. Consider including public art at key gateways, major projects, and public gathering places.

LU-3.9: Public Landscaping. Ensure that all public landscaping in public rights-of-way is attractive, adequately maintained, and utilizes California native, drought-tolerant, and/or other sustainable plant material if appropriate.

LU-4.1: Major Corridors. Enhance the streetscape along the City's major corridors through coordinated public and private improvements to convey a positive image of the City, contribute to its economic vitality, and improve visual and physical transitions into adjacent neighborhoods and developments.

LU-4.2: Walkability. Enhance walkability on a citywide scale by improving or adding sidewalks, landscaping, benches, wayfinding signage, and pedestrian-scaled lighting, where appropriate and feasible.

LU-4.3: Building Massing. Reduce the bulk and perceived size of large buildings by dividing their mass into smaller parts, stepping down to adjacent structures, recessing openings for doors/windows, and using pedestrian-scale features; single-plane massing is discouraged.

LU-4.4: Building Footprint. Require and enforce appropriate residential and nonresidential development standards, including adequate building setbacks, to ensure that a building's footprint does not negatively affect adjacent uses or the visual quality of the area.

LU-4.5: Connectivity. Provide convenient pedestrian and transit access throughout commercial and mixed-use corridors, including an interconnected network of high-amenity streetscapes and multiple walkways that connect activities and uses.

LU-4.6: Street Trees. Recognize the importance of planting and maintaining trees consistent with the image of Lake Forest. Provide for the consistent use of street trees to identify city streets, residential neighborhoods, commercial and employment districts, and gateways.

LU-4.7: Medians. Encourage medians the use of California-native landscaping, where feasible. Require the provision of street medians, where appropriate, as a condition of approval of development projects.

LU-5.7: Design Integration. Require that residential and nonresidential portions of mixed-use buildings and sites be integrated through site and building design to ensure compatibility among uses.

LU-5.8: On-Site Amenities. Require that residential/commercial mixed-use projects provide on-site gathering spaces (plazas, courtyards, etc.) and other pedestrian-scale amenities, such as benches, fountains, and landscaping, that contribute to the living environment of residents.

RR-1.4: Design and Maintenance. Promote implementation of established design, construction, and facility maintenance standards to ensure that existing and future City amenities are of high quality in regard to safety, utility, environmental stewardship, and aesthetic quality.

RR-1.9: Landscaping. Protect local and regional resources by fortifying new parks and recreational development with sustainable drought-tolerant landscaping.

RR-2.1: Open Space Boundaries. Maintain the amount of existing open space within the City of Lake Forest by carefully considering the impact of new development in established open space areas.

RR-2.2: Regional Partners. Coordinate with regional partners to maintain and preserve open space areas under overlapping jurisdiction or within nearby communities to protect all local and regional opportunities for recreation available to Lake Forest residents.

RR-2.3: Scenic Resources. Protect Lake Forest's scenic resources, including scenic corridors along roads and views of the hillsides, prominent ridgelines, canyons, and other significant natural features, to the extent practical.

RR-2.4: Education. Work with state, federal, and community partners to develop educational and other materials that promote the preservation and conservation of Lake Forest's natural resources.

ACTIONS

LU-4a: Consider developing a design and improvement plan based on the City Capital Improvement Plan to strengthen landscaping, identification graphics, and other physical improvements to enhance major public thoroughfares and activity areas.

Impact 3.1-2: General Plan implementation would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway (Less than Significant)

As discussed in the settings section, no adopted State scenic highway is located in Lake Forest. There is only one officially designated scenic highway corridor in Orange County: a small portion of the CA-91, running through Anaheim Hills from the Intersection of the CA-91 and CA-55 to the portion of the CA-91 adjacent to the Yorba Regional Park (Caltrans, 2017). However, this officially designated scenic highway corridor does not provide views of Lake Forest or the immediate surrounding areas, and there are no sections of highway in the Lake Forest vicinity eligible for Scenic Highway designation.

The Orange County General Plan identifies El Toro Road and the portion of Santa Margarita Parkway located within Lake Forest as a landscape corridor (within its Scenic Highway Plan). Implementation of the Lake Forest General Plan would not conflict with this designation. Given that no adopted State scenic highways are located within the Planning Area, and that no scenic highways provide views of the Planning Area, State scenic highway impacts associated with General Plan implementation would be **less than significant**.

Impact 3.1-3: General Plan implementation would not, in a non-urbanized area, substantially degrade the existing visual character or quality of public views of the site and its surroundings, or in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality (Less than Significant)

CEQA Guidelines Section 15387 defines an urbanized area as a central city or a group of contiguous cities with a population of 50,000 or more, together with adjacent densely populated areas having a population density of at least 1,000 persons per square mile. The Planning Area consists of the City of Lake Forest, which can be understood as an urbanized area as well as Lake Forest's Sphere of Influence, which is contiguous with its City limits. Zoning and other regulations governing scenic quality applicable to the City of Lake Forest include the Lake Forest Citywide Design Guidelines, the El Toro Redevelopment Project Area Design Guidelines, the Light Industrial Design Guidelines. Policies in the proposed General Plan are intended to complement and further the intent of these provisions regulating scenic quality and resources, and any development occurring under the proposed General Plan would be subject to compliance with these guidelines, as well as the applicable regulations set forth in the Lake Forest Municipal Code. The proposed General Plan would therefore not substantially degrade the existing visual character or quality of public views of the Sphere of Influence and its surroundings. Scenic quality-related impacts associated with the General Plan implementation would thus be **less than significant**. In order to further ensure that future development allowed under the General Plan would not degrade the existing visual character of the environment, the City has included the following policies and actions in the General Plan.

GENERAL PLAN POLICIES AND ACTIONS THAT MINIMIZE POTENTIAL IMPACTS

Policies LU-2.1, LU-2.3, LU-2.4, LU-2.5, LU-2.6, LU-2.7, LU-2.9, LU-3.1, LU-3.2, LU-3.3, LU-3.4, LU-3.5, LU-3.6, LU-3.7, LU-3.8, LU-4.1, LU-4.2, LU-4.3, LU-4.4, LU-4.5, LU-4.6, LU-4.7, LU-5.7, LU-5.8, RR-1.4, RR-1.9, RR-2.1, RR-2.2, RR-2.3, RR-2.4, and Action LU-4a, as discussed under Impact 3.1-1.

Impact 3.1-4: General Plan implementation could result in the creation of new sources of nighttime lighting and daytime glare (Less than Significant)

The primary sources of daytime glare are generally sunlight reflecting from structures and other reflective surfaces and windows. Implementation of the proposed General Plan would introduce new sources of daytime glare into previously developed areas of the Planning Area and increase the amount of daytime glare in existing urbanized areas. The General Plan Land Use Map identifies areas for the future development of residential, commercial, industrial, recreational, and public uses. Such uses may utilize materials that produce glare. Daytime glare impacts would be most severe in the limited areas of the city that have not been previously disturbed, including the limited number of vacant parcels designated for urbanized land uses, and in areas that receive a high level of daily viewership.

The primary sources of nighttime lighting are generally from exterior building lights, street lights, and vehicle headlights. Exterior lighting around commercial and industrial areas may be present throughout the night to facilitate extended employee work hours, ensure worker safety, and to provide security lighting around structures and facilities. Nighttime lighting impacts would be most severe in areas that do not currently experience high levels of nighttime lighting. Increased nighttime lighting can reduce visibility of the night sky, resulting in fewer stars being visible and generally detracting from the quality of life in Lake Forest. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

Future development would be required to be consistent with the General Plan, as well as lighting and design requirements in the Lake Forest Municipal Code. The proposed General Plan contains policies and actions related to the regulation and reduction of daytime glare and nighttime lighting. Implementation of Action LU-2a would require that new commercial projects do not generate excessive glare or light onto adjacent properties. Additionally, Action LU-2b would ensure that new developments are designed to minimize glare and light impacts onto adjacent properties, in general.

These actions would ensure that new development projects utilize appropriate building materials that do not result in significant increases in nighttime lighting or daytime glare.

Through the implementation of these actions during the development review process, the City can ensure that adverse impacts associated with daytime glare and nighttime lighting are reduced to a **less than significant** level.

GENERAL PLAN ACTIONS THAT MITIGATE POTENTIAL IMPACTS

LU-2a: As part of the City's development review process, ensure that commercial projects are designed to be compatible with residential uses, including appropriate building massing and scale and minimization of impacts related to the operation of the use. Review of employment-generating projects should ensure that the following design concepts are addressed in projects that abut residential areas:

- *Appropriate building scale and/or siting.*
- *Site design and noise-attenuating features to avoid exposure to excessive noise due to long hours of operation or inappropriate location of accessory structures.*
- *Site and structure design to avoid excessive glare or excessive impacts from light sources onto adjacent properties; and*
- *Site design to avoid unnecessary loss of community and environmental resources (archaeological, historical, ecological, recreational, etc.).*

LU-2b: As part of the City's development review process, ensure that new developments are designed to minimize glare and light impacts onto adjacent properties.

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This section provides a background discussion of agricultural lands, agricultural resources, and forest/timber resources found in the Lake Forest Planning Area. This section is organized with an environmental setting, regulatory setting, and impact analysis.

No comments on this environmental topic were received during the NOP comment period.

3.2.1 ENVIRONMENTAL SETTING

AGRICULTURAL RESOURCES

There are no lands within the Planning Area that are designated for agricultural use on the existing or proposed Lake Forest Land Use Map.

Agriculture land, in the form of designated Important Farmlands as defined by the California Department of Conservation, makes up 2.1% (191 acres) of the City's total acreage. Agricultural lands surrounding the city, outside of the Planning Area in unincorporated Orange County, are designated as Agriculture on the Orange County General Plan Land Use Map. This County land use category includes general agricultural uses, horse ranches, nurseries, and other agriculture.

Important Farmlands

The California Department of Conservation (DOC), as part of its Farmland Mapping and Monitoring Program (FMMP), prepares Important Farmland Maps indicating the potential value of land for agricultural production. The Orange County Important Farmland Map identifies five agriculture-related categories and three non-agricultural categories:

Prime Farmland: Prime farmland is land with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. The land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Farmland of Statewide Importance: Farmland of statewide importance is farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. The land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

Unique Farmland: Unique farmland is farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

Farmland of Local Importance: Farmland of local importance is considered land important to the local agricultural economy but does not meet the criteria of Prime Farmland, Farmland of Statewide Importance, or Unique Farmland.

Grazing Land: Grazing land is land on which the existing vegetation is suitable for the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association,

University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for this category is 40 acres.

Urban and Built-up Land: This category consists of non-agricultural land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

Other Land: Other land is non-agricultural land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and non-agricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Water Area: This category consists of bodies of water.

IMPORTANT FARMLANDS IN PLANNING AREA

Limited agricultural production exists within the City. The existing agricultural land within the City is primarily located within one parcel: the Nakase parcel located in the center of the City. According to the most current DOC maps, this parcel is designated as Unique Farmland. The approximately 122-acre site currently contains a wholesale nursery (Nakase Brothers Nursery) and support structures such as a greenhouse and office area. The City is currently reviewing a proposed General Plan Amendment, Zone Change, Development Agreement, Area Plan and Vesting Tentative Tract Map to redevelop this property with residential, open space, and educational uses.

The Planning Area contains 0.2 acres of Prime Farmland and 140.1 acres of Unique Farmland. Table 3.2-1 provides an overview of the types of farmlands within the City, and Figure 3.2-1 shows the location of the farmlands within the City.

TABLE 3.2-1: FARMLAND TYPES IN LAKE FOREST

FARMLAND TYPE	*ACRES IN CITY*
Urban/Built-Up Land	7,970.1
Grazing Land	38.7
Prime Farmland	0.2
Unique Farmland	140.1
Other Land	2,593.2

SOURCE: DEPARTMENT OF CONSERVATION, 2019.

Farmland Preservation

The California Land Conservation Act, also known as the Williamson Act, was adopted in 1965 to encourage the preservation of the state's agricultural lands and to prevent their premature conversion to urban uses. The Williamson Act is described in greater detail under the Regulatory Setting section of this chapter.

There are no lands within the Lake Forest Planning Area that are currently under a Williamson Act contract.

FOREST RESOURCES

Forest land is defined by Public Resources Code Section 12220(g), and includes *"land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits."*

Timber land is defined by Public Resources Code Section 4526, and means *"land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis."*

There are no forest lands or timber lands located within the Lake Forest Planning Area.

3.2.2 REGULATORY SETTING

FEDERAL

Farmland Protection Policy Act

The Natural Resources Conservation Service (NRCS), an agency within the U.S. Department of Agriculture, is responsible for implementation of the Farmland Protection Policy Act (FPPA). The purpose of the FPPA is to minimize Federal programs' contribution to the conversion of farmland to non-agricultural uses by ensuring that Federal programs are administered in a manner that is compatible with state, local, and private programs designed to protect farmland. The NRCS provides technical assistance to Federal agencies, state and local governments, tribes, and nonprofit organizations that desire to develop farmland protection programs and policies. The NRCS summarizes FPPA implementation in an annual report to Congress.

Farm and Ranch Lands Protection Program

The NRCS administers the Farm and Ranch Lands Protection Program (FRPP), a voluntary program aimed at keeping productive farmland in agricultural uses. Under the FRPP, the NRCS provides matching funds to state, local, or tribal government entities and nonprofit organizations with existing farmland protection programs to purchase conservation easements. According to the 1996 Farm Bill, the goal of the program is to protect between 170,000 and 340,000 acres of farmland per year. Participating landowners agree not to convert the land to non-agricultural use and retain all rights to use the property for agriculture. A conservation plan must be developed for all lands enrolled based upon the standards contained in the NRCS Field Office Technical Guide. A minimum of 30 years is required for conservation easements and priority is given to applications with perpetual easements. The NRCS provides up to 50 percent of the fair market value of the easement being conserved (NRCS, 2004). To qualify for a conservation easement, farm or ranch land must meet several criteria. The land must be:

- Prime, Unique, or other productive soil, as defined by NRCS based on factors such as water moisture regimes, available water capacity, developed irrigation water supply, soil temperature range, acid-alkali balance, water table, soil sodium content, potential for flooding, erodibility, permeability rate, rock fragment content, and soil rooting depth;
- Included in a pending offer to be managed by a nonprofit organization, state, tribal, or local farmland protection program;
- Privately owned;
- Placed under a conservation plan;
- Large enough to sustain agricultural production;
- Accessible to markets for the crop that the land produces; and
- Surrounded by parcels of land that can support long-term agricultural production.

STATE

California Department of Conservation

The DOC administers and supports a number of programs, including the Williamson Act, the California Farmland Conservancy Program (CFCP), the Williamson Act Easement Exchange Program (WAEEP), and the Farmland Mapping and Monitoring Program (FMMP). These programs are designed to preserve agricultural land and provide data on conversion of agricultural land to urban use. The DOC has authority for the approval of agreements entered into under the WAEEP. Key DOC tools available for land conservation planning are conservation grants, tax incentives to keep land in agriculture or open space, and farmland mapping and monitoring.

Williamson Act

The California Land Conservation Act, also known as the Williamson Act, was adopted in 1965 to encourage the preservation of the state's agricultural lands and to prevent their premature conversion to urban uses. In order to preserve these uses, the Act established an agricultural preserve contract procedure by which any county or city taxes landowners at a lower rate, using a scale based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. In return, the owners guarantee that these properties remain under agricultural production for a 10-year period. The contract is self-renewing; however, the landowner may notify the county or city at any time of the intent to withdraw the land from its preserve status. There are two means by which the landowner may withdraw the land from its contract preserve status. First, the landowner may seek to cancel the contract. This takes the land out of the contract quickly with a minimal waiting period but the landowner pays a statutory penalty to the State. Second, the landowner may notice a non-renewal or seek a partial non-renewal of the contract. Land withdrawal through the non-renewal process involves a 9- or 10-year period (depending on the timing of the notice) of tax adjustment to full market value before protected open space can be converted to urban uses.

Williamson Act subvention payments to local governments have been suspended since the fiscal year 2009-10 due to the State’s fiscal constraints. The Williamson Act contracts between landowners and local governments remain in force, regardless of the availability of subvention payments.

Farmland Security Zones

A Farmland Security Zone is an area created within an agricultural preserve by a board of supervisors (board) or city council (council) upon request by a landowner or group of landowners. An agricultural preserve defines the boundary of an area within which a city or county will enter into contracts with landowners. The boundary is designated by resolution of the board or council having jurisdiction. Agricultural preserves must generally be at least 100 acres in size. Farmland Security Zone contracts offer landowners greater property tax reduction. Land restricted by a Farmland Security Zone contract is valued for property assessment purposes at 65% of its Williamson Act valuation or 65% of its Proposition 13 valuation, whichever is lower.

Forest Practices Rules

The California Department of Forestry and Fire Protection (CalFire) implements the laws that regulate timber harvesting on privately-owned lands. These laws are contained in the Z'berg-Nejedly Forest Practice Act of 1973 which established a set of rules known as the Forest Practice Rules (FPRs) to be applied to forest management related activities (i.e., timber harvests, timberland conversions, fire hazard removal, etc.). They are intended to ensure that timber harvesting is conducted in a manner that will preserve and protect fish, wildlife, forests, and streams. Under the Forest Practice Act, a Timber Harvesting Plan (THP) is submitted to CalFire by the landowner outlining what timber is proposed to be harvested, harvesting method, and the steps that will be taken to prevent damage to the environment. If the landowner intends to convert timberland to non-timberland uses, such as a winery or vineyard, a Timberland Conversion Permit (TCP) is required in addition to the THP. It is CalFire's intent that a THP will not be approved which fails to adopt feasible mitigation measures or alternatives from the range of measures set out or provided for in the Forest Practice Rules, which would substantially lessen or avoid significant adverse environmental impacts resulting from timber harvest activities. THPs are required to be prepared by Registered Professional Foresters (RPFs) who are licensed to prepare these plans (CalFire, 2007). For projects involving TCPs, CalFire acts as lead agency under CEQA, and the county or city acts as a responsible agency.

3.2.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on agricultural and forest resources if it will:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526);
- Result in the loss of forest land or conversion of forest land to non-forest use; or

- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

There are no forest lands or timber lands located within the Lake Forest Planning Area. There are also no parcels that are currently zoned as forest land, timber, or timber production. Therefore, implementation of the proposed General Plan would have no impact on forest land, timber, or timber production and this impact will not be discussed further.

IMPACTS AND MITIGATION MEASURES

Impact 3.2-1: General Plan implementation would result in the conversion of farmlands, including Prime Farmland and Unique Farmland, to non-agricultural use (Significant and Unavoidable)

As shown in Table 3.2-1, there are approximately 140.3 acres of Important Farmlands located within the City, including 0.2 acres of Prime Farmland and 140.1 acres of Unique Farmland. The Prime Farmland is located west of Alton Parkway and south of State Route 241, adjacent to an area containing Unique Farmland. The Prime Farmland area is currently developed with residential uses (Shea/Baker Ranch Project). The Unique Farmland is located in two nearby areas in the center of the City: one area west of Alton Parkway and south of State Route 241 (adjacent to the 0.2 acres of Prime Farmland), and one area east of Bake Parkway and south of Rancho Parkway. The Unique Farmland area west of Alton Parkway and south of State Route 241 is currently developed with residential uses (Shea/Baker Ranch Project). The Unique Farmland area east of Bake Parkway and south of Rancho Parkway is known as the Nakase site. The Nakase site contains the Nakase Brothers Wholesale Nursery.

The Shea/Baker Ranch Project Initial Study (State Clearinghouse number 2004071039) found that the Shea/Baker Ranch Project would not result in impacts to Important Farmland beyond those disclosed in the Opportunities Study Area Program Environmental Impact Report (EIR). The Program EIR for the Opportunities Study Area Project was certified in July 2008. The Program EIR found that the Opportunities Study Area Project would result in conversion of Important Farmland, which is a significant and unavoidable impact. Implementation of the proposed General Plan would not result in increased impacts to the Unique Farmland and Prime Farmland in the Shea/Baker Ranch area.

The Nakase site currently contains a wholesale nursery (Nakase Brothers Nursery) and support structures such as a greenhouse and office area. There is currently a redevelopment project under review to convert this property into mixed-use development knowns as the Nakase Nursery/Toll Brothers Project. The Draft EIR for the Nakase Nursery/Toll Brothers Project (State Clearinghouse number 2018071035) was released in August 2019. The Draft EIR found that the Nakase Nursery/Toll Brothers Project would result in conversion of 119.2 acres of Unique Farmland, which is a significant and unavoidable impact. As of writing this Draft EIR for the General Plan Update, the Draft EIR for the Nakase Nursery/Toll Brothers Project has not been certified, and the Findings of Fact and Statement of Overriding Considerations have not been adopted.

The City's existing General Plan designates the Nakase Project site as Business Park and Business Development Overlay (BDO). The Business Park land use designation is intended to provide a mix of uses as allowed under the Commercial, Professional Office, and Light Industrial designations. The Business Park designation does not provide for agricultural uses. The proposed General Plan Land Use Map does not identify any potential changes to the Business Park land use designation for the Nakase site.

As shown on the General Plan Land Use Map (Figure 2.0-3), all of the land within the Planning Area is planned for urban development in one form or another, with the exception of areas designated for Open Space or Regional Park/Open Space uses. Therefore, it is assumed that the agricultural viability of all of the Important Farmlands within the City will eventually be lost upon full buildout of the Lake Forest General Plan. Future development of the Nakase site consistent with the General Plan Land Use Map would result in conversion of the Unique Farmland. The Nakase site is located in an area surrounded by urban development on all sides.

In summary, the Draft EIR for the Nakase Nursery/Toll Brothers Project has not been certified, and the Findings of Fact and Statement of Overriding Considerations have not been adopted. Should the Nakase Nursery/Toll Brothers Project not be approved, the site would remain in the current condition in the short term, but would be expected to eventually convert to urban uses sometime in the future. Implementation of the proposed General Plan may lead to the urbanization of this portion of Unique Farmland in the long-term, should the Nakase Nursery/Toll Brothers Project not be approved. This is considered a **significant and unavoidable** impact.

There is no feasible mitigation available to reduce this impact to a less than significant level. The Nakase site has been designated for urban uses since the City adopted the 1994 General Plan. The site is completely surrounded by urban uses, and is located within the geographic center of Lake Forest. As such, there is no long-term agricultural viability of the site. Adoption of the proposed General Plan Update would not lead to the direct conversion of designated Unique Farmland, but rather, would continue the existing land use pattern in Lake Forest that calls for ongoing infill development and urbanization within the City. The only hypothetical mitigation approach would be to designate the Nakase site as an Agricultural land use. Not only does the City not have an Agricultural land use category in the General Plan, the conversion of the Nakase site to an agricultural designation would run counter to the City's goals of quality infill development and the provision of a range of land uses to meet the needs of future generations. As such, there is no feasible mitigation available for this impact.

Impact 3.2-2: General Plan implementation would not result in conflicts with existing zoning for agricultural use, or a Williamson Act contract (Less than Significant)

There are no lands within the Lake Forest Planning Area that are currently under a Williamson Act contract. As such, General Plan implementation would result in no impact to Williamson Act contracts.

However, there are 521.45 acres of land throughout the Planning Area that are zoned for agricultural use. The City has one zoning district for agricultural uses: A1, Agriculture District. The A1 District is established to provide for agriculture, outdoor recreational uses, and those low-

intensity uses which have a predominately open space character. It is also intended that this district may be used as an interim zone in those areas which the General Plan may designate for more intensive urban uses in the future. All 521.45 acres of land mentioned previously are zoned A1. Lands zoned A1 are scattered throughout the City, including the Nikase site, north of State Route 241, along the Metrolink rail, along Trabuco Road, along El Toro Road, and elsewhere. The majority of the land zoned A1 is currently developed with urban uses or is currently designated for urban uses by both the existing and proposed Land Use Maps. There are some areas in Lake Forest zoned A1 that are not urbanized, but rather, are designated for Regional Park/Open Space uses on the Land Use Map.

As shown on the proposed General Plan Land Use Map (Figure 2.0-3), all of the land within the Planning Area is planned for urban development in one form or another, with the exception of areas designated for Open Space or Regional Park/Open Space uses. The areas designated for Open Space or Regional Park/Open Space uses by the proposed Land Use Map which are also zoned A1 would not be developed with urban uses as a result of General Plan implementation. It is assumed that the land within the City zoned A1 and not designated for Open Space or Regional Park/Open Space uses will eventually be developed with urban land uses, consistent with the proposed Land Use Map.

While the Zoning Code and Zoning Map currently identify parcels in Lake Forest with the A1 Agriculture District, the City's Zoning Code makes clear that parcels with this designation are not intended to be used exclusively for agricultural uses. As noted above, the A1 District is appropriate for outdoor recreational uses, low-intensity uses with an open space character, and as an interim zone for areas that the General Plan may designate for more intensive urban uses in the future. Given the purpose, intent, and flexibility of the established A1 Zoning District, the proposed Land Use Map would not conflict with existing agricultural zoning in the City of Lake Forest.

Actions LU-1a and LU-1b call for the City to update the Zoning Map and Zoning Code to bring them into consistency with the General Plan Land Use Map and standards, following completion of the General Plan Update. Implementation of these action items would reduce this potential impact to a **less than significant** level, and would ensure consistency between the General Plan and the Zoning Code. No additional mitigation is required.

GENERAL PLAN ACTIONS THAT MITIGATE POTENTIAL IMPACTS

ACTIONS

LU-1a. Update the City's Zoning Map to be consistent with the land use designations shown on Figure LU-1.

LU-1b: Review the standards provided in the Zoning Ordinance (Title 9 of the Lake Forest Municipal Code) and amend as necessary for consistency with General Plan policies and allowed uses.

Impact 3.2-3: General Plan implementation would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use (Less than Significant)

As noted above in Impact 3.2-1, General Plan implementation may result in the future conversion of Unique Farmland on the Nakase site. The Nakase site is surrounded by existing urban uses on all sides. The site is bound by Bake Parkway, Rancho Parkway, and commercial and industrial uses to the north, Lake Forest Drive and industrial and commercial uses to the east, industrial and commercial uses to the south, and residential and industrial uses to the west. Agricultural and forest land uses are not located in the vicinity of the Nakase site. As shown in Figure 3.2-1, the Nakase site is surrounded by Urban/Built-Up Land.

Future development consistent with the General Plan Land Use Map would result in conversion of the Unique Farmland on the Nakase site, which has been identified as a significant and unavoidable impact in this EIR. However, because Important Farmland or other agricultural land uses are not located in the vicinity of the Nakase site, any future urbanization of the Nakase site would not lead to the indirect conversion of other nearby agricultural operations or Important Farmlands. General Plan implementation would result in a **less than significant** impact relative to this topic and no mitigation is required.

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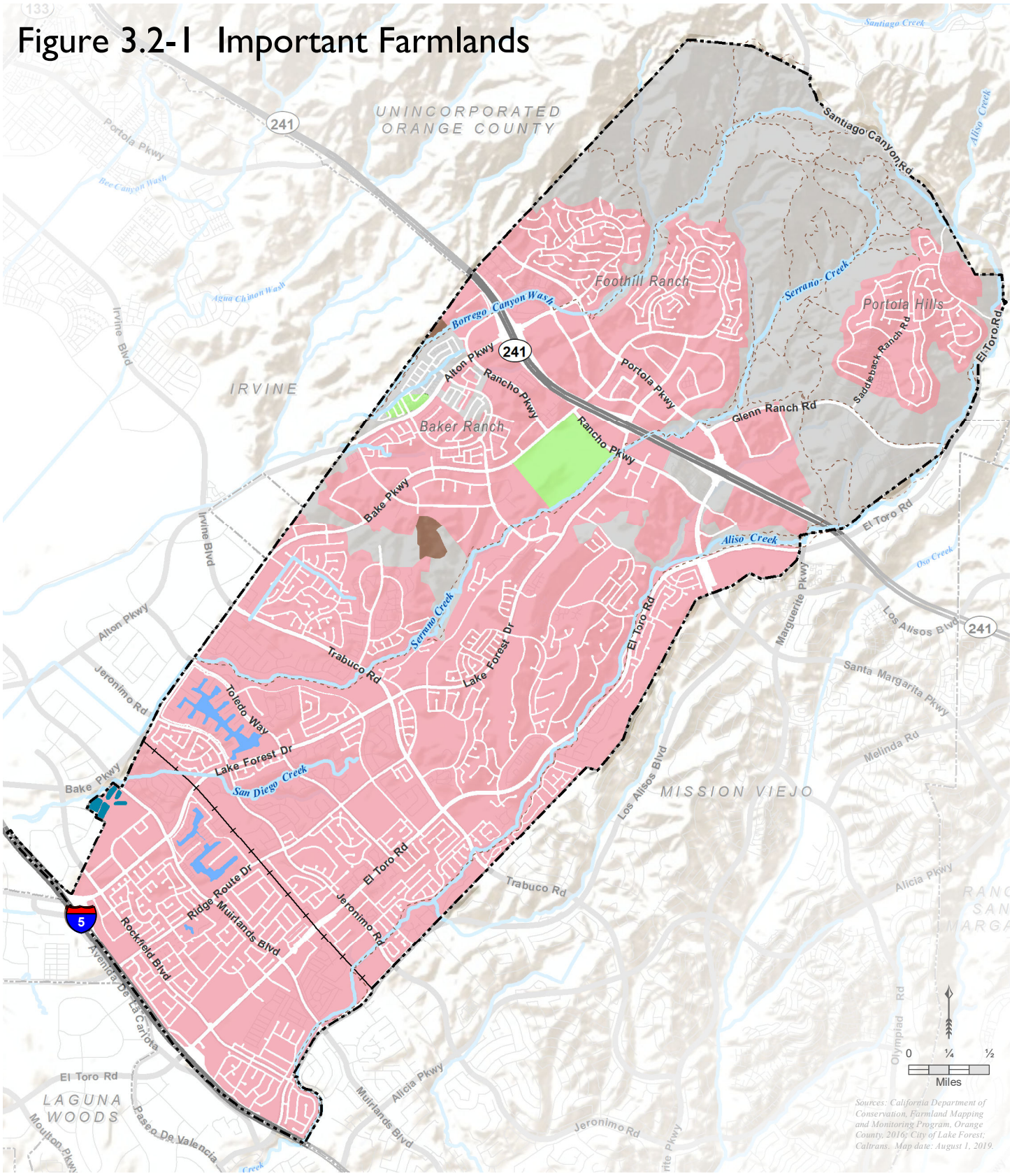
Figure 3.2-1 Important Farmlands



Legend

- City of Lake Forest
- Other City Boundaries
- Riding & Hiking Trails
- Prime Farmland (0.2 ac)
- Unique Farmland (140.0 ac)
- Grazing Land (38.7 ac)
- Other Land (2,593.2 ac)
- Urban/Built-Up Land (7,970.1 ac)

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A Land Use Planning, Design, and Environmental Firm

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This section describes the regional air quality, current attainment status of the applicable air basin, local sensitive receptors, emission sources, and impacts that are likely to result from proposed project implementation.

No comments were received during the NOP comment period regarding this environmental topic.

3.3.1 EXISTING SETTING

SOUTH COAST AIR BASIN

Lake Forest is located within the South Coast Air Basin (SCAB, or Basin). The Basin is regulated by a single air quality management district: the Southern California Air Quality Management District (SCAQMD). The SCAQMD consists of Orange County, the western portion of Los Angeles County, the southwestern portion of San Bernardino County, and the western portion of Riverside County. Air quality in this area is determined by such natural factors as topography, meteorology, climate, as well as existing air pollution sources and ambient conditions. These factors along with applicable regulations are discussed below. The combination of topography, low mixing height, abundant sunshine, and emissions from the second-largest urban area in the United States give the Basin the worst air pollution problem in the nation.

Climate, Topography, and Air Pollution Potential

The clean air challenge in the South Coast has always been formidable. Complex terrain and weather patterns make the region a natural sink for the accumulation of emissions and sustained high pollution levels. Along the coastal area, better air quality prevails because of the relatively mild climate, cooler temperatures, and a pattern of onshore airflow. However, in the inland portion of the air basin, a combination of abundant sunshine, warm temperatures, and poor vertical air mixing is conducive to the formation of ozone, commonly referred to as “smog.” The problem is further aggravated by the surrounding mountains that act together with the weather and air pollutant emissions.

The accumulation of smog is further heightened by the extent of exposure to elevated pollution levels. The South Coast Air Basin is the nation’s second largest urban area and California’s largest metropolitan region. It includes the southern two-thirds of Los Angeles County, all of Orange County, and the western urbanized portions of Riverside and San Bernardino counties. The South Coast Air Basin is home to over 40 percent of the total State population, or about 16 million people, and over 10 million vehicles. Fifty thousand heavy duty diesel trucks travel nearly 10 million miles through the region annually, and well over 50,000 diesel engines are used to move goods and power construction and mining equipment.

Air quality for all pollutants in the Basin continues to improve, with recent years registering the lowest levels since measurements began over six decades ago. During the 1960s, maximum 1-hour concentrations were well above levels considered safe for public health – more than four times the current health standard. In recent times, the maximum measured concentrations are less than one-third of those peak concentrations. Moreover, long-term ozone air quality trends continue to

show an overall improvement. The number of days above both the one and eight-hour standards has also declined dramatically.

Because of weather patterns and geography, residual pollution from the South Coast Air Basin is transported to several downwind air basins -- the Mojave Desert, the Salton Sea, the South Central Coast, and San Diego. As ozone precursor emissions in the South Coast Air Basin decrease over time, the transport impact on the downwind areas will also decline.

The majority of annual rainfall in the South Coast Air Basin occurs between November and April. Summer rainfall is minimal and is generally limited to scattered thunder showers in coastal regions and slightly heavier showers in the eastern portion of the Basin and along the coastal side of the mountains. Lake Forest has a Mediterranean climate with moderate, dry summers. The average July high temperature in Lake Forest is 90 degrees Fahrenheit, and the average January low temperature is 44 degrees Fahrenheit. The City receives about 19 inches of rain per year.

The Basin experiences a persistent temperature inversion (increasing temperature with increasing altitude) as a result of the Pacific high. This inversion limits the vertical dispersion of air contaminants, holding them relatively near to the ground. As the sun warms the ground and the lower air layer, the temperature of the lower air layer approaches the temperature of the base of the inversion (upper) layer until the inversion layer finally breaks, allowing vertical mixing with the lower layer. This phenomenon is observed in mid to late afternoons on hot summer days. Winter inversions frequently break by midmorning.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore into Riverside and San Bernardino counties. In the winter, the greatest pollution problem is the accumulation of CO and nitrogen oxides (NOx) due to low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and NOx to form photochemical smog.

CRITERIA POLLUTANTS

All criteria pollutants can have human health and environmental effects at certain concentrations. The United States Environmental Protection Agency (USEPA) uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS). In addition, California establishes ambient air quality standards, called California Ambient Air Quality Standards (CAAQS). California law does not require that the CAAQS be met be a specified date as is the case with NAAQS.

The ambient air quality standards for the six criteria pollutants (as shown in Table 3.3-1) are set to public health and the environment within an adequate margin of safety (as provided under Section 109 of the Federal Clean Air Act). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants, and form the

scientific basis for new and revised ambient air quality standards. Principal characteristics and possible health and environmental effects from exposure to the six primary criteria pollutants generated by the Project are discussed below.

Ozone (O_3) is a photochemical oxidant and the major component of smog. While ozone in the upper atmosphere is beneficial to life by shielding the earth from harmful ultraviolet radiation from the sun, high concentrations of ozone at ground level are a major health and environmental concern. Ozone is not emitted directly into the air but is formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC)[1] and oxides of nitrogen (NOx) in the presence of sunlight. These reactions are stimulated by sunlight and temperature so that peak ozone levels occur typically during the warmer times of the year. Both VOCs and NOx are emitted by transportation and industrial sources. VOCs are emitted from sources as diverse as autos, chemical manufacturing, dry cleaners, paint shops and other sources using solvents.

The reactivity of ozone causes health problems because it damages lung tissue, reduces lung function and sensitizes the lungs to other irritants. Scientific evidence indicates that ambient levels of ozone not only affect people with impaired respiratory systems, such as asthmatics, but healthy adults and children as well. Exposure to ozone for several hours at relatively low concentrations has been found to significantly reduce lung function and induce respiratory inflammation in normal, healthy people during exercise. This decrease in lung function generally is accompanied by symptoms including chest pain, coughing, sneezing and pulmonary congestion.

Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (U.S. Environmental Protection Agency 2019a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (U.S. Environmental Protection Agency 2019b). The average background level of ozone in the California and Nevada is approximately 48.3 parts per billion, which represents approximately 77 percent of the total ozone in the western region of the U.S. (NASA, 2015).

In addition to human health effect, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. Ozone can also act as a corrosive and oxidant, resulting in property damage such as the degradation of rubber products and other materials. Ozone concentrations tend to be highest in summer and lowest in winter.

[1] The CARB uses the term "Reactive Organic Gases" (ROG) in place of "Volatile Organic Compounds" (VOC).

Over long-term timeframes, ozone concentrations in California have decreased (California Air Resources Board, 2019b). On a more local level, data from the California Resources Board shows an approximately 47 percent reduction in ozone levels in the SCAB region from 1992 to 2011 (California Air Resources Board, 2014). In 2016, Orange County had 13 days where ozone levels were above the regulatory standard (Lucile Packard Foundation for Children's Health, 2019). The California Air Resources Board (CARB) also forecasts that emissions of VOCs and NOx in the SCAB will continue to reduce over time (NOx is projected to be reduced from 451 tons/day in 2015 to 257 tons/day in 2035, and VOCs are projected to decrease from 429 tons/day in 2015 to 391 tons/day in 2035) (CARB, 2013).

Carbon monoxide (CO) is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. Carbon monoxide is harmful because it binds to hemoglobin in the blood, reducing the ability of blood to carry oxygen. This interferes with oxygen delivery to the body's organs. The most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain. For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress. Inadequate oxygen delivery to the heart muscle leads to chest pain and decreased exercise tolerance. Unborn babies whose mothers experience high levels of CO exposure during pregnancy are at risk of adverse developmental effects (California Air Resources Board, 2019c). Exposure to CO at high concentrations can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects to ambient CO (California Air Resources Board, 2019d).

Very high levels of CO are not likely to occur outdoors. However, when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease. These people already have a reduced ability for getting oxygenated blood to their hearts in situations where the heart needs more oxygen than usual. They are especially vulnerable to the effects of CO when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina (USEPA, 2016). Such acute effects may occur under current ambient conditions for some sensitive individuals, while increases in ambient CO levels increases the risk of such incidences.

CO concentrations tend to be highest in fall and winter and lowest in spring and summer. Over the long-term, CO concentrations have decreased throughout the United States. Average concentrations of CO have reduced from approximately 333 parts per billion in 2000 to approximately 132 parts per billion in 2017, in California and Nevada (i.e. the West region, as defined by the USEPA) (USEPA, 2018).

Nitrogen dioxide (NO_2) is a brownish, highly reactive gas that is present in all urban atmospheres. The main effect of increased NO_2 is the increased likelihood of respiratory problems. Under ambient conditions, NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections. Nitrogen oxides are an important precursor both to ozone and acid rain, and may affect both terrestrial and aquatic ecosystems. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase

susceptibility to respiratory infections. People with asthma, as well as children and the elderly are generally at greater risk for the health effects of NO_2.

The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NOx). NOx plays a major role, together with VOCs, in the atmospheric reactions that produce ozone. NOx forms when fuel is burned at high temperatures. The two major emission sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

NO_2 concentrations tend to be highest in winter and lowest in summer. Over the long-term, nitrogen dioxide concentrations have generally been decreasing throughout the United States (USEPA, 2018). Average concentrations of NO_2 have reduced from approximately 69 parts per billion in 2000 to approximately 48 parts per billion in 2017, in California and Nevada (i.e. the West region, as defined by the USEPA) (USEPA, 2018). Data from the CARB shows an approximately 51 percent reduction in NO_2 emissions in the SCAB region from 1992 to 2011 (California Air Resources Board, 2014).

Sulfur dioxide (SO_2) is one of the multiple gaseous oxidized sulfur species and is formed during the combustion of fuels containing sulfur, primarily coal and oil. The largest anthropogenic source of SO_2 emissions in the U.S. is fossil fuel combustion at electric utilities and other industrial facilities. SO_2 is also emitted from certain manufacturing processes and mobile sources, including locomotives, large ships, and construction equipment.

SO_2 affects breathing and may aggravate existing respiratory and cardiovascular disease in high doses. Sensitive populations include asthmatics, individuals with bronchitis or emphysema, children and the elderly. SO_2 is also a primary contributor to acid deposition, or acid rain, which causes acidification of lakes and streams and can damage trees, crops, historic buildings and statues. In addition, sulfur compounds in the air contribute to visibility impairment in large parts of the country. This is especially noticeable in national parks. Ambient SO_2 results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills and from nonferrous smelters.

Short-term exposure to ambient SO_2 has been associated with various adverse health effects. Multiple human clinical studies, epidemiological studies, and toxicological studies support a causal relationship between short-term exposure to ambient SO_2 and respiratory morbidity. The observed health effects include decreased lung function, respiratory symptoms, and increased emergency department visits and hospitalizations for all respiratory causes. These studies further suggest that people with asthma are potentially susceptible or vulnerable to these health effects. In addition, SO_2 reacts with other air pollutants to form sulfate particles, which are constituents of fine particulate matter ($PM_{2.5}$). Inhalation exposure to $PM_{2.5}$ has been associated with various cardiovascular and respiratory health effects (USEPA, 2017). Increased ambient SO_2 levels would lead to increased risk of such effects.

SO_2 emissions that lead to high concentrations of SO_2 in the air generally also lead to the formation of other sulfur oxides (SO_x). SO_x can react with other compounds in the atmosphere to form small

particles. These particles contribute to particulate matter (PM) pollution. Small particles may penetrate deeply into the lungs and in sufficient quantity can contribute to health problems.

Over the long-term, sulfur dioxide concentrations have decreased throughout the United States (USEPA, 2018). Average concentrations of SO_2 have reduced from approximately 17.6 parts per billion in 2000 to approximately 6.2 parts per billion in 2017 at monitoring sites in California and Nevada (i.e. the West region, as defined by the USEPA) (USEPA, 2018).

Particulate matter (PM) includes dust, dirt, soot, smoke and liquid droplets directly emitted into the air by sources such as factories, power plants, cars, construction activity, fires and natural windblown dust. Particles formed in the atmosphere by condensation or the transformation of emitted gases such as SO_2 and VOCs are also considered particulate matter. PM is generally categorized based on the diameter of the particulate matter: PM_{10} is particulate matter 10 micrometers or less in diameter (known as respirable particulate matt*er*), and $PM_{2.5}$ is particulate matter 2.5 micrometers or less in diameter (known as fine particulate matter).

Based on studies of human populations exposed to high concentrations of particles (sometimes in the presence of SO_2) and laboratory studies of animals and humans, there are major effects of concern for human health. These include effects on breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alterations in the body's defense systems against foreign materials, damage to lung tissue, carcinogenesis and premature death. Small particulate pollution has even health impacts even at very low concentrations – indeed no threshold has been identified below which no damage to health is observed.

Respirable particulate matter (PM_{10}) consists of small particles, less than 10 microns in diameter, of dust, smoke, or droplets of liquid which penetrate the human respiratory system and cause irritation by themselves, or in combination with other gases. Particulate matter is caused primarily by dust from grading and excavation activities, from agricultural uses (as created by soil preparation activities, fertilizer and pesticide spraying, weed burning and animal husbandry), and from motor vehicles, particularly diesel-powered vehicles. PM_{10} causes a greater health risk than larger particles, since these fine particles can more easily penetrate the defenses of the human respiratory system.

Fine particulate matter ($PM_{2.5}$) consists of small particles, which are less than 2.5 microns in size. Similar to PM_{10}, these particles are primarily the result of combustion in motor vehicles, particularly diesel engines, as well as from industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM_{10}, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer. In 1997, the USEPA created new Federal air quality standards for $PM_{2.5}$.

The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary or cardiovascular disease or influenza, asthmatics, the elderly and children. Particulate matter also soils and damages materials, and is a major cause of visibility impairment.

Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lunch function, and increased respiratory symptoms. Studies show that every 1 microgram per cubic meter reduction in $PM_{2.5}$ results in a one percent reduction in mortality rate for individuals over 30 years old (Bay Area Air Quality Management District, 2017). Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis – and even premature death. Additionally, depending on its composition, both PM_{10} and $PM_{2.5}$ can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. Environmental Protection Agency, 2019c).

PM concentrations tend to be highest in winter and spring and lowest in summer. The CARB identifies that total emissions of PM in the SCAB region have decreased from 88 tons/day in 2000 to 67 tons per day in 2015. Additionally, the CARB forecasts that emissions of PM in the SCAB will remain relatively constant from 2015 to 2035 (increasing from 67 tons per day in 2015 to 71 tons per day in 2035) (CARB, 2013).

Lead (Pb) exposure can occur through multiple pathways, including inhalation of air and ingestion of Pb in food, water, soil or dust. Once taken into the body, lead distributes throughout the body in the blood and is accumulated in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. Excessive Pb exposure can cause seizures, mental retardation and/or behavioral disorders. Low doses of Pb can lead to central nervous system damage. Recent studies have also shown that Pb may be a factor in high blood pressure and subsequent heart disease.

Lead is persistent in the environment and can be added to soils and sediments through deposition from sources of lead air pollution. Other sources of lead to ecosystems include direct discharge of waste streams to water bodies and mining. Elevated lead in the environment can result in decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

Lead exposure is typically associated with industrial sources; major sources of lead in the air are ore and metals processing and piston-engine aircraft operating on leaded aviation fuel. Other sources are waste incinerators, utilities, and lead-acid battery manufacturers. The highest air concentrations of lead are usually found near lead smelters. As a result of the USEPA's regulatory efforts, including the removal of lead from motor vehicle gasoline, levels of lead in the air decreased by 98 percent between 1980 and 2014 (USEPA, 2019d). Based on this reduction of lead in the air over this period, and since most new developments to not generate an increase in lead exposure, the health impacts of ambient lead levels are not typically monitored by the CARB.

TOXIC AIR CONTAMINANTS

In addition to the criteria air pollutants listed above, another group of pollutants, commonly referred to as toxic air contaminants (TACs) or hazardous air pollutants can result in health effects that can be quite severe. Many TACs are confirmed or suspected carcinogens, or are known or suspected to cause birth defects or neurological damage. Additionally, many TACs can be toxic at very low concentrations. For some chemicals, such as carcinogens, there are no thresholds below which exposure can be considered risk-free.

It is important to understand that TACs are not considered criteria air pollutants and thus are not specifically addressed through the setting of ambient air quality standards. Instead, the USEPA and CARB regulate hazardous air pollutants (HAPs) and TACs through statutes and regulations that generally require the use of the maximum or best available control technology (MACT and BACT) to limit emissions. MACT and BACT standards, in conjunction with additional rules set forth by the SCAQMD, establish the regulatory framework for regulating TACs. The SCAQMD maintains approximately 23 rules regulating toxics and other non-criteria pollutants.

Industrial facilities and mobile sources are significant sources of TACs. Sources of TACs go beyond industry. Various common urban facilities also produce TAC emissions, such as gasoline stations (benzene), hospitals (ethylene oxide), and dry cleaners (perchloroethylene). Automobile exhaust also contains TACs such as benzene and 1,3-butadiene. Diesel particulate matter has also been identified as a TAC by the CARB. Diesel PM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. The SCAQMD research indicates that mobile-source emissions of diesel PM, benzene, and 1,3-butadiene represent a substantial portion of the ambient background risk from TACs in the SCAB.

Sensitive receptors, which include children, the sick, and the elderly, may be especially impacted by TACs. Sensitive receptors located within Lake Forest include: residences, schools, and senior care facilities. However, sources of TACs (such as industrial facilities and gasoline stations) are generally located at a sufficient distance from sensitive receptors that the potential for substantial deleterious health effects to these sensitive receptors from TACs is minimized.

Examples of current SCAQMD Rules relating to TACs are as follows: SCAQMD Rule 1401 requires a new source review of TACs from new permit units, relocations, or modifications to existing permit units which emit TACs. Rule 1401.1 provides requirements for new and relocated TAC-emitting facilities near schools. Rule 1403 provides work practice requirements to limit asbestos emissions from building demolition and renovation activities. Rule 1404 reduces the level of hexavalent chromium emissions allowed from cooling towers. Rule 1469-1 provides limitations on spraying operations using coatings containing chromium. Additionally, Rule 1472 provides requirements for facilities with multiple stationary emergency standby diesel-fueled internal combustion engines.

Diesel Exhaust

According to the California Almanac of Emissions and Air Quality, the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from the exhaust of diesel-fueled engines, i.e., diesel particulate matter (DPM).

DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances.

Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra-fine diesel particulates are of the greatest health concern, and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines; the on-road diesel engines of trucks, buses and cars and the off-road diesel engines that include locomotives, marine vessels and heavy-duty equipment. Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

The most common exposure to DPM is breathing air that contains diesel exhaust. The fine and ultra-fine particles are respirable (similar to $PM_{2.5}$), which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lung. Exposure to DPM comes from both on-road and off-road engine exhaust that is either directly emitted from the engines or lingering in the atmosphere.

Gasoline Exhaust

Similar to diesel exhaust, exhaust from gasoline-fueled engines is composed of two phases, gas and particle, both of which contribute to health risks. The gas phase is composed of the same hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra-fine diesel particulates are of the greatest health concern, and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements. Gasoline exhaust is primarily emitted from light-duty passenger vehicles. The compounds in the gas and particles phases can cause health effects from short and long-term exposures.

Visibility Reducing Particles

Visibility-reducing particles are any particles in the atmosphere that obstruct the range of visibility by creating haze. These particles vary in shape, size and chemical composition, and come from a variety of natural and manmade sources including windblown metals, soil, dust, salt, and soot. Other haze-causing particles are formed in the air from gaseous pollutant (e.g., sulfates, nitrates, organic carbon particles) which are the major constituents of fine PM, such as $PM_{2.5}$ and PM_{10}, and are caused from the combustion of fuel. The CARB's standard for visibility reducing particles is not based on health effects, but rather on welfare effects, such as reduced visibility and damage to materials, plants, forests, and ecosystems.

ODORS

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

SENSITIVE RECEPTORS

A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals and schools. It also includes long-term care hospitals, hospices, prisons, and dormitories or similar live-in housing.

Because the proposed project is a planning document that does not include exact locations, sizes, or land use type for any individual projects that will occur within the City under the General Plan, there are no specific sensitive locations identified with respect to the proposed project. As a conservative estimate of impacts, sensitive receptors are anticipated to be located directly adjacent to new development.

AMBIENT AIR QUALITY

Both the USEPA and the CARB have established ambient air quality standards for common pollutants. These ambient air quality standards represent safe levels of contaminants that avoid specific adverse health effects associated with each pollutant. Each pollutant is measured over several standardized timeframes (called the averaging times), which provide a standard to compare monitored levels of pollutants to the federal and state standards. Each criteria pollutant has more than one average time – for example, the state ambient air quality standard for ozone is monitored over both a 1-hour and 8-hour periods.

The federal and California state ambient air quality standards are summarized in Table 3.3-1 for important pollutants. The federal and state ambient standards were developed independently, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM_{10}.

TABLE 3.3-1: FEDERAL AND STATE AMBIENT AIR QUALITY STANDARDS

POLLUTANT	*AVERAGING TIME*	*FEDERAL PRIMARY STANDARD*	*STATE STANDARD*
Ozone	1-Hour 8-Hour	-- 0.070 ppm	0.09 ppm 0.070 ppm
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.53 ppm 0.100 ppm	0.03 ppm 0.18 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm 0.075 ppm	-- 0.04 ppm 0.25 ppm
PM_{10}	Annual 24-Hour	-- 150 ug/m^3	20 ug/m^3 50 ug/m^3
$PM_{2.5}$	Annual 24-Hour	15 ug/m^3 35 ug/m^3	12 ug/m^3 --
Lead	30-Day Avg. Calendar Quarter	-- 1.5 ug/m^3	1.5 ug/m^3 --

NOTES: PPM = PARTS PER MILLION, PPB = PARTS PER BILLION, UG/M^3 = MICROGRAMS PER CUBIC METER
SOURCES: CALIFORNIA AIR RESOURCES BOARD, 2019E.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within the Planning Area are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, and odors. The primary source of ozone (smog) pollution is motor vehicles which account for 70 percent of the ozone in the region. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

Attainment Status

In accordance with the California Clean Air Act (CCAA), the CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria.

Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An "unclassified" designation signifies that the data do not support either an attainment or nonattainment status. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The USEPA designates areas for ozone, CO, and NO_2 as "does not meet the primary standards," "cannot be classified," or "better than national standards." For SO_2, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." However, the CARB terminology of attainment, nonattainment, and unclassified is more frequently used.

Orange County has a state designation of Nonattainment for ozone, $PM_{2.5}$ and PM_{10}, and a state designation of either Unclassified or Attainment for all other criteria pollutants. Orange County has a national designation of Nonattainment for ozone and $PM_{2.5}$ and a national designation of either Attainment or Unclassified for all other criteria pollutants. Table 3.3-2 presents the state and national attainment status for Orange County.

TABLE 3.3-2: STATE AND NATIONAL ATTAINMENT STATUS (ORANGE COUNTY)

CRITERIA POLLUTANTS	*STATE DESIGNATIONS*	*NATIONAL DESIGNATIONS*
Ozone	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment	Unclassified/Attainment
Nitrogen Dioxide	Attainment	Unclassified/Attainment
Sulfur Dioxide	Attainment	Unclassified/Attainment
Sulfates	Attainment	N/A
Lead	Attainment	Unclassified/Attainment
Hydrogen Sulfide	Unclassified	N/A
Visibility Reducing Particles	Unclassified	N/A

SOURCE: CALIFORNIA AIR RESOURCES BOARD, 2018.
NOTE: N/A = NO FEDERAL STANDARD

Orange County Monitoring

The CARB maintains numerous air quality monitoring sites throughout Orange County to measure ozone, PM_{10}, and $PM_{2.5}$. The closest monitoring site to the Planning Area with recent data is the Mission Viejo-26081 Via Pera monitoring site, which is located approximately ¼ mile southeast of Lake Forest. The latest data obtained from the monitoring sites in Orange County (available for year 2016 through 2018) is summarized in Tables 3.3-3, 3.3-4, and Table 3.3-5. It is important to note that the federal ozone 1-hour standard was revoked by the USEPA and is no longer applicable for federal standards.

TABLE 3.3-3: ORANGE COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - OZONE

YEAR	DAYS > STANDARD			1-HOUR OBSERVATIONS			8-HOUR AVERAGES				YEAR COVERAGE	
	STATE		NATIONAL		STATE	NAT'L	STATE		NATIONAL			
	1-HR	8-HR	8-HR	MAX.	D.V.[1]	D.V.[2]	MAX.	D.V.[1]	MAX.	D.V.[2]	MIN	MAX
2018	2	10	9	0.121	0.10	0.104	0.088	0.089	0.088	0.078	97	97
2017	3	27	25	0.103	0.10	0.101	0.084	0.089	0.083	0.078	98	99
2016	5	13	13	0.122	0.10	0.104	0.094	0.089	0.093	0.077	99	99

*NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. THE NATIONAL 1-HOUR OZONE STANDARD WAS REVOKED IN JUNE 2005 AND IS NO LONGER IN EFFECT. STATISTICS RELATED TO THE REVOKED STANDARD ARE SHOWN IN ITALICS. D.V. [1] = STATE DESIGNATION VALUE. D.V. [2]= NATIONAL DESIGN VALUE. * MEANS THERE WAS INSUFFICIENT DATA AVAILABLE TO DETERMINE THE VALUE.*

SOURCE: CARB AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM (ADAM) AIR POLLUTION SUMMARIES.

TABLE 3.3-4: ORANGE COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - $PM_{2.5}$

YEAR	EST. DAYS > NAT'L '06 STD.	ANNUAL AVERAGE		NAT'L ANN. STD. D.V.[1]	STATE ANNUAL D.V.[2]	NAT'L '06 STD. 98TH PERCENTILE	NAT'L '06 24-HR STD. D.V.[1]	HIGH 24-HOUR AVERAGE		YEAR COVERAGE
		NAT'L	STATE					NAT'L	STATE	
2018	*	*	*	*	7	*	*	38.9	38.9	88
2017	*	*	*	*	7	*	*	19.5	19.5	95
2016	0.0	7.3	7.3	*	7	13.4	*	24.7	24.7	97

*NOTES: ALL CONCENTRATIONS EXPRESSED IN PARTS PER MILLION. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. D.V. [1] = STATE DESIGNATION VALUE. D.V. [2]= NATIONAL DESIGN VALUE. * MEANS THERE WAS INSUFFICIENT DATA AVAILABLE TO DETERMINE THE VALUE.*

SOURCE: CARB AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM (ADAM) AIR POLLUTION SUMMARIES.

TABLE 3.3-5: ORANGE COUNTY AMBIENT AIR QUALITY MONITORING DATA SUMMARY - PM_{10}

YEAR	EST. DAYS > STD.		ANNUAL AVERAGE		3-YEAR AVERAGE		HIGH 24-HR AVERAGE		YEAR COVERAGE
	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	NAT'L	STATE	
2018	0.0	6.0	19.5	19.1	20	19	55.6	55.6	96
2017	0.0	6.5	18.8	18.8	19	19	58.2	58.2	95
2016	0.0	*	21.0	*	20	20	59.0	59.3	97

*NOTES: THE NATIONAL ANNUAL AVERAGE PM_{10} STANDARD WAS REVOKED IN DECEMBER 2006 AND IS NO LONGER IN EFFECT. AN EXCEEDANCE IS NOT NECESSARILY A VIOLATION. STATISTICS MAY INCLUDE DATA THAT ARE RELATED TO AN EXCEPTIONAL EVENT. STATE AND NATIONAL STATISTICS MAY DIFFER FOR THE FOLLOWING REASONS: STATE STATISTICS ARE BASED ON CALIFORNIA APPROVED SAMPLERS, WHEREAS NATIONAL STATISTICS ARE BASED ON SAMPLERS USING FEDERAL REFERENCE OR EQUIVALENT METHODS. STATE AND NATIONAL STATISTICS MAY THEREFORE BE BASED ON DIFFERENT SAMPLERS. NATIONAL STATISTICS ARE BASED ON STANDARD CONDITIONS. STATE CRITERIA FOR ENSURING THAT DATA ARE SUFFICIENTLY COMPLETE FOR CALCULATING VALID ANNUAL AVERAGES ARE MORE STRINGENT THAN THE NATIONAL CRITERIA. * MEANS THERE WAS INSUFFICIENT DATA AVAILABLE TO DETERMINE THE VALUE.*

SOURCE: CARB AEROMETRIC DATA ANALYSIS AND MANAGEMENT SYSTEM (ADAM) AIR POLLUTION SUMMARIES.

3.3.2 REGULATORY SETTING

FEDERAL

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The USEPA is responsible for administering the FCAA. The FCAA requires the USEPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health (with an adequate margin of safety, including for sensitive populations such as children, the elderly, and individuals suffering from respiratory diseases), and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

NAAQS standards define clean air and represent the maximum amount of pollution that can be present in outdoor air without any harmful effects on people and the environment. Existing violations of the ozone and $PM_{2.5}$ ambient air quality standards indicate that certain individuals exposed to these pollutants may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments.

NAAQS standards have been designed to accurately reflect the latest scientific knowledge and are reviewed every five years by a Clean Air Scientific Advisory Committee (CASAC), consisting of seven members appointed by the USEPA administrator. Reviewing NAAQS is a lengthy undertaking and includes the following major phases: Planning, Integrated Science Assessment (ISA), Risk/Exposure Assessment (REA), Policy Assessment (PA), and Rulemaking. The process starts with a comprehensive review of the relevant scientific literature. The literature is summarized and conclusions are presented in the ISA. Based on the ISA, USEPA staff perform a risk and exposure assessment, which is summarized in the REA document. The third document, the PA, integrates the findings and conclusions of the ISA and REA into a policy context, and provides lines of reasoning that could be used to support retention or revision of the existing NAAQS, as well as several alternative standards that could be supported by the review findings. Each of these three documents is released for public comment and public peer review by the CASAC. Members of CASAC are appointed by the USEPA Administrator for their expertise in one or more of the subject areas covered in the ISA. The committee's role is to peer review the NAAQS documents, ensure that they reflect the thinking of the scientific community, and advise the Administrator on the technical and scientific aspects of standard setting. Each document goes through two to three drafts before CASAC deems it to be final.

Although there is some variability among the health effects of the NAAQS pollutants, each has been linked to multiple adverse health effects including, among others, premature death, hospitalizations and emergency department visits for exacerbated chronic disease, and increased symptoms such as coughing and wheezing. NAAQS standards were last revised for each of the six criteria pollutants as listed below, with detail on what aspects of NAAQS changed during the most recent update:

- Ozone: On October 1, 2015, the U.S. EPA lowered the national eight-hour standard from 0.075 ppm to 0.070 ppm, providing for a more stringent standard consistent with the current California state standard.
- CO: In 2011, the primary standards were retained from the original 1971 level, without revision. The secondary standards were revoked in 1985.
- NO_2: The national NO_2 standard was most recently revised in 2010 following an exhaustive review of new literature pointed to evidence for adverse effects in asthmatics at lower NO_2 concentrations than the existing national standard.
- SO_2: On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb.
- PM: the national annual average $PM_{2.5}$ standard was most recently revised in 2012 following an exhaustive review of new literature pointed to evidence for increased risk of premature mortality at lower $PM_{2.5}$ concentrations than the existing standard.
- Lead: The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. In 2016, the primary and secondary standards were retained.

The law recognizes the importance for each state to locally carry out the requirements of the FCAA, as special consideration of local industries, geography, housing patterns, etc. are needed to have full comprehension of the local pollution control problems. As a result, the USEPA requires each state to develop a State Implementation Plan (SIP) that explains how each state will implement the FCAA within their jurisdiction. A SIP is a collection of rules and regulations that a particular state will implement to control air quality within their jurisdiction. The CARB is the state agency that is responsible for preparing and implementing the California SIP.

Transportation Conformity

Transportation conformity requirements were added to the FCAA in the 1990 amendments, and the EPA adopted implementing regulations in 1997. See §176 of the FCAA (42 U.S.C. §7506) and 40 CFR Part 93, Subpart A. Transportation conformity serves much the same purpose as general conformity: it ensures that transportation plans, transportation improvement programs, and projects that are developed, funded, or approved by the United States Department of

Transportation or that are recipients of funds under the Federal Transit Act or from the Federal Highway Administration (FHWA), conform to the SIP as approved or promulgated by EPA.

Currently, transportation conformity applies in nonattainment areas and maintenance areas (maintenance areas are those areas that were in nonattainment that have been redesignated to attainment, under the FCCA). Under transportation conformity, a determination of conformity with the applicable SIP must be made by the agency responsible for the project, such as the Metropolitan Planning Organization, the Council of Governments, or a federal agency. The agency making the determination is also responsible for all the requirements relating to public participation. Generally, a project will be considered in conformance if it is in the transportation improvement plan and the transportation improvement plan is incorporated in the SIP. If an action is covered under transportation conformity, it does not need to be separately evaluated under general conformity.

Transportation Control Measures

One particular aspect of the SIP development process is the consideration of potential control measures as a part of making progress towards clean air goals. While most SIP control measures are aimed at reducing emissions from stationary sources, some are typically also created to address mobile or transportation sources. These are known as transportation control measures (TCMs). TCM strategies are designed to reduce vehicle miles traveled and trips, or vehicle idling and associated air pollution. These goals are achieved by developing attractive and convenient alternatives to single-occupant vehicle use. Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

STATE

California Clean Air Act

The CCAA was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. The CARB is the agency responsible for administering the CCAA. The CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards.

California Air Quality Standards

Although NAAQS are determined by the USEPA, states have the ability to set standards that are more stringent than the federal standards. As such, California established more stringent ambient air quality standards. Federal and state ambient air quality standards have been established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulates (PM_{10}) and lead. In addition, California has created standards for pollutants that are not covered by federal standards. Although there is some variability among the health effects of the CAAQS pollutants, each has been linked to multiple adverse health effects including, among others, premature death, hospitalizations and emergency department visits for exacerbated chronic disease, and increased

symptoms such as coughing and wheezing. The existing state and federal primary standards for major pollutants are shown in Table 3.3-1.

Air quality standard setting in California commences with a critical review of all relevant peer reviewed scientific literature. The Office of Environmental Health Hazard Assessment (OEHHA) uses the review of health literature to develop a recommendation for the standard. The recommendation can be for no change, or can recommend a new standard. The review, including the OEHHA recommendation, is summarized in a document called the draft Initial Statement of Reasons (ISOR), which is released for comment by the public, and also for public peer review by the Air Quality Advisory Committee (AQAC). AQAC members are appointed by the President of the University of California for their expertise in the range of subjects covered in the ISOR, including health, exposure, air quality monitoring, atmospheric chemistry and physics, and effects on plants, trees, materials, and ecosystems. The Committee provides written comments on the draft ISOR. The ARB staff next revises the ISOR based on comments from AQAC and the public. The revised ISOR is then released for a 45-day public comment period prior to consideration by the Board at a regularly scheduled Board hearing.

In June of 2002, the CARB adopted revisions to the PM_{10} standard and established a new $PM_{2.5}$ annual standard. The new standards became effective in June 2003. Subsequently, staff reviewed the published scientific literature on ground-level ozone and nitrogen dioxide and the CARB adopted revisions to the standards for these two pollutants. Revised standards for ozone and nitrogen dioxide went into effect on May 17, 2006 and March 20, 2008, respectively. These revisions reflect the most recent changes to the CAAQS.

CARB Mobile-Source Regulation

The State of California is responsible for controlling emissions from the operation of motor vehicles in the state. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB's motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations which required auto manufacturers to phase in less polluting vehicles.

CARB Air Quality and Land Use Handbook

The CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* addresses the importance of considering health risk issues when siting sensitive land uses, including residential development, in the vicinity of intensive air pollutant emission sources including freeways or high-traffic roads, distribution centers, ports, petroleum refineries, chrome plating operations, dry cleaners, and gasoline dispensing facilities. The CARB Handbook draws upon studies evaluating the health effects of traffic traveling on major interstate highways in metropolitan California centers within Los Angeles (Interstate [I] 405 and I-710), the San Francisco Bay, and San Diego areas. The recommendations identified by the CARB, including siting residential uses a minimum distance of 500 feet from freeways or other high-traffic roadways, are consistent with those adopted by the State of California for location of new schools. Specifically, the CARB Handbook recommends,

"Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day" (CARB, 2005).

Tanner Air Toxics Act

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for the CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before the CARB can designate a substance as a TAC. To date, the CARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. Once a TAC is identified, the CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology (BACT) to minimize emissions.

The AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. The CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, the CARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Other recent milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

LOCAL

South Coast Air Quality Management District

The SCAQMD shares responsibility with the CARB for ensuring that all state and federal ambient air quality standards are achieved and maintained over an area of approximately 10,743 square miles. This area includes all of Orange County and Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County.

The SCAQMD reviews projects to ensure that they do not (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay the timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan.

The SCAQMD is responsible for controlling emissions primarily from stationary sources. The SCAQMD maintains air quality monitoring stations throughout the South Coast Air Basin. In coordination with the Southern California Association of Governments (SCAG), the SCAQMD is also responsible for developing, updating, and implementing the Air Quality Management Plan (AQMP) for the South Coast Air Basin. An AQMP is a plan prepared and implemented by an air pollution district for a county or region designated as nonattainment of the national and/or California ambient air quality standards.

In 2003, an AQMP was prepared by the SCAQMD to bring the South Coast Air Basin, as well as portions of the Salton Sea Air Basin under the SCAQMD jurisdiction, into compliance with the 1-hour ozone and PM_{10} national standards. The 2003 AQMP also replaced the 1997 attainment demonstration for the federal CO standard and provided a basis for a maintenance plan for CO for the future. It also updated the maintenance plan for the federal NO_2 standard, which the South Coast Air Basin has met since 1992.

A subsequent AQMP for the Basin was adopted by the SCAQMD on June 1, 2007. The goal of the 2007 AQMP was to lead the South Coast Air Basin into compliance with the national 8-hour ozone and PM2.5 standards. The 2007 AQMP outlined a detailed strategy for meeting the national health-based standards for $PM_{2.5}$ by 2015 and 8-hour ozone by 2024 while accounting for and accommodating future expected growth. The 2007 AQMP incorporated significant new emissions inventories, ambient measurements, scientific data, control strategies, and air quality modeling. Most of the reductions were to be from mobile sources, which are currently responsible for about 75 percent of all smog and particulate-forming emissions.

The SCAQMD approved the 2012 AQMP on December 7, 2012. The 2012 AQMP incorporated the latest scientific and technological information and planning assumptions, including the 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and updated emission inventory methodologies for various source categories. The 2012 AQMP outlines a comprehensive control strategy that meets the requirement for expeditious progress toward attainment with the 24-hour $PM_{2.5}$ federal ambient air quality standard with all feasible control measures and demonstrates attainment of the standard by 2014. The 2012 AQMP also updates the 8-hour ozone control plan with new emission reduction commitments from a set of new control measures that implement the 2007 AQMP's Section 182 (e)(5) commitments. The goal of the Final 2012 AQMP is to lead the Basin into compliance with the national 8-hour ozone and $PM_{2.5}$ standards.

The SCAQMD approved the Final 2016 AQMP on March 3, 2017. The 2016 AQMP includes transportation control measures developed by the SCAG from the 2016–2040 RTP/SCS, as well as the integrated strategies and measures needed to meet the NAAQS. The 2016 AQMP demonstrates attainment of the 1-hour and 8-hour ozone NAAQS as well as the latest 24-hour and annual $PM_{2.5}$ standards.

The SCAQMD has also prepared the 2010 Clean Communities Plan (Formerly the Air Toxics Control Plan), the Air Quality Monitoring Network Plan, the Vision for Air: A Framework for Air Quality and Climate Plan.

The SCAQMD is responsible for limiting the amount of emissions that can be generated throughout the basin by various stationary, area, and mobile sources. Specific rules and regulations have been adopted by the SCAQMD Governing Board that (1) limit the emissions that can be generated by various uses and activities; and (2) identify specific pollution reduction measures, which must be implemented in association with various uses and activities. These rules regulate the emissions of not only the federal and state criteria pollutants, but also TACs and acutely hazardous materials. The rules are also subject to ongoing refinement by the SCAQMD.

Among the SCAQMD rules that may be applicable to the proposed project are Rule 401 (Visible Emissions), Rule 402 (Nuisance), Rule 403 (Fugitive Dust), Rule 1113 (Architectural Coatings), Rule 1138 (Control of Emissions from Restaurant Operations), Rule 1146.2 (Emissions of Oxides of Nitrogen from Large Water Heaters and Small Boilers and Process Heaters), and Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities). Rule 401 restricts the emissions of air contaminants that significantly reduce air opacity. Rule 402 restricts discharges that cause nuisance to the public. Rule 403 requires the use of stringent best available control measures (BACMs) to minimize PM_{10} emissions during grading and construction activities. Rule 1113 requires reductions in the VOC content of coatings. Rule 1138 specifies PM and VOC emissions and odor control requirements for some kinds of commercial cooking operations. Rule 1146.2 restricts the NOx emissions from natural gas-fired water heaters, boilers, and process heaters as defined by this rule. Compliance with SCAQMD Rule 1403 requires the owner or operator of any demolition or renovation activity to have an asbestos survey performed prior to demolition and to provide notification to the SCAQMD prior to commencing demolition activities.

SCAQMD's CEQA guidelines are voluntary initiatives recommended for consideration by local planning agencies. The CEQA *Air Quality Handbook* (Handbook) published by the SCAQMD provides local governments with guidance for analyzing and mitigating project-specific air quality impacts (SCAQMD, 1993). The SCAQMD is currently updating some of the information and methods in the Handbook, such as the screening tables for determining the air quality significance of a project and the on-road mobile source emission factors. While this process is underway, the SCAQMD recommends using other approved models to calculate emissions from land use projects, such as CalEEMod.

The SCAQMD *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning* considers impacts on air quality sensitive receptors from TAC-emitting facilities (SCAQMD, 2005). The SCAQMD's siting distance recommendations are the same as those provided by the CARB (e.g., a 500-foot siting distance for air quality sensitive receptors proposed in proximity to freeways and high-traffic roads, and the same siting criteria for distribution centers and dry cleaning facilities).

SCAG Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

The SCAG is the MPO for the region in which the City of Lake Forest is located. In 2016, the SCAG adopted the 2016 Regional Transportation Plan/Sustainable Communities Strategy: A Plan for

Mobility, Accessibility, Sustainability and a High Quality of Life (RTP/SCS), which is an update to the previous 2012 RTP/SCS (SCAG, 2016).

The 2016 RTP/SCS considers the role of transportation in the broader context of economic, environmental, and quality-of-life goals for the future, identifying regional transportation strategies to address mobility needs. The 2016 RTP/SCS describes how the region can attain the GHG emission-reduction targets set by the CARB by achieving an 8 percent reduction in passenger vehicle GHG emissions on a per capita basis by 2020, 18 percent reduction by 2035, and 21 percent reduction by 2040 compared to the 2005 level. Although the focus of the 2016 RTP/SCS is on GHG emission-reduction, compliance with and implementation of 2016 RTP/SCS policies and strategies would also have co-benefits of reducing per capita criteria air pollutant and TAC emissions associated with reduced per capita VMT. Improved air quality with implementation of the 2016 RTP/SCS policies would decrease reactive organic gases (ROG) (i.e., VOCs) by 8 percent, CO by 9 percent, NOx by 9 percent, and $PM_{2.5}$ by 5 percent (SCAG, 2016).

The SCAG's 2016 RTP/SCS builds on the land use policies that were incorporated into the 2012 RTP/SCS, and provides specific strategies for successful implementation. These strategies include development of "complete communities", defined as mixed-use districts that concentrate housing, employment, and a mix of retail and services in close proximity to each other; encouraging employment development around current and planned transit and neighborhood commercial centers; complete s icy that meets the needs of all users of the streets, roads and highways including bicyclists, children, persons with disabilities, motorists, electric vehicles, movers of commercial goods, pedestrians, users of public transportation, and seniors; and supporting alternative fueled vehicles. The 2016 RTP/SCS overall land use pattern reinforces the trend of focusing new housing and employment in infill areas well served by transit.

In addition, the 2016 RTP/SCS includes goals and strategies to promote active transportation and improve transportation demand management (TDM). The 2016 RTP/SCS strategies support local planning and projects that serve short trips, increase access to transit, expand understanding and consideration of public health in the development of local plans and projects, and support improvements in sidewalk quality, local bike networks, and neighborhood mobility areas. The 2016 RTP/SCS proposes to better align active transportation investments with land use and transportation strategies, increase competitiveness of local agencies for federal and state funding, and to expand the potential for all people to use active transportation.

LOCAL

Orange County General Plan

Orange County adopted its most current General Plan in 2005, with a number of amendments since that time. The County's General Plan provides a comprehensive set of goals, policies, and implementing actions to guide the County's growth. The County's General Plan includes the following elements: Land Use, Transportation, Public Services and Facilities, Resources, Recreation, Noise, Safety, Housing, and Growth Management.

Green Building Design

The City of Lake Forest encourages homeowners and building professionals to incorporate green building design in construction activities through the use of "green" building materials. This can be accomplished by referencing the Home Remodeling Green Building Guidelines and implementing green measures into a home remodeling project.

3.3.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE FOR CRITERIA POLLUTANTS

Consistent with Appendix G of the CEQA Guidelines and the SCAQMD thresholds of significance, the project will have a significant impact on the environment associated with air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; and/or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

METHODOLOGY AND ASSUMPTIONS

A brief discussion of the methodology and assumptions used to estimate proposed project's air pollutant emissions is provided below. For further detail on air emissions modeling parameters and assumptions, and other related calculations, see Appendix C.

Construction

Construction of the growth anticipated by the proposed project would have the potential to temporarily emit criteria air pollutant emissions through the use of heavy-duty construction equipment, such as excavators, cranes, and forklifts, and through vehicle trips generated from workers and haul trucks traveling to and from project sites. In addition, fugitive dust emissions would result from demolition and various soil-handling activities. Construction emissions of VOC, NOx, CO, SO_2, PM_{10} and $PM_{2.5}$ are included in this analysis. Construction emissions can vary substantially from day-to-day, depending on the intensity and specific type of construction activity. The maximum daily regional emissions are predicted values for the worst-case day and do not represent the emissions that would actually occur during every day of construction.

The proposed project is a planning-level document, and, as such, there are no specific projects, project construction dates, or specific construction plans identified. Therefore, quantification of emissions associated with buildout cannot be specifically determined at this time. However, the type and size of total anticipated growth is known. Construction emissions are based on the type and amount of off-road construction equipment and the scope of future development that could be allowed under the proposed project. Therefore, since CalEEMod provides default construction scenarios based on size and land use type, a reasonable worst case annual construction scenario

was analyzed to provide an idea of daily emissions that could occur due to construction under the proposed project.[2] Full buildout of the proposed project (based on the land use assumptions provided by the proposed project), which is expected to occur by 2040, were modeled in CalEEMod.[3]

Construction was estimated to begin in June of 2020 and continue throughout 2040. Emission calculations assumed construction in 2021 as a conservative peak emissions year. In a year later, construction emissions would be less because cleaner construction equipment and vehicle fleet mix are expected as a result of State regulations that require cleaner construction equipment to be phased-in for heavy-duty equipment. Thus, construction emissions occurring in later years would be less than the impacts disclosed herein.

Construction activities were modeled to include site preparation, excavation/grading, building construction, paving, and architectural coating. CalEEMod defaults were used to determine construction equipment based on the type of construction. Modeling assumed the land uses contained in Table 2.0-3 of Chapter 2.0: Project Description.

Daily regional criteria air pollutant emissions for the different phases of construction were forecast based on construction activities, on-road and off-road mobile sources, and fugitive dust emission factors associated with the specific construction activity. Off-road mobile source emissions would result from the use of heavy-duty construction equipment such as bulldozers, loaders, and cranes. These off-road mobile sources emit VOC, NOx, CO, SO2, PM_{10} and $PM_{2.5}$. The emissions were estimated using CalEEMod (v.2016.3.2) software, an emissions inventory software program recommended by the SCAQMD. CalEEMod is based on outputs from the OFFROAD model and EMission FACtor (EMFAC) model, which are emissions estimation models developed by CARB and used to calculate emissions from construction activities, heavy-duty off-road equipment, and on-road vehicles. Activities parameters, such as number of equipment and equipment usage hours were provided by the future applicant.

Fugitive dust emissions (using PM_{10} as a surrogate) during construction activities were estimated in CalEEMod, which are based on the methods described in the US EPA AP-42 Compilation of Air Pollutant Emission Factors. During the application of architectural coatings, evaporation of solvents contained in surface coatings result in VOC emissions. CalEEMod was used to calculate VOC emissions based on the building surface area and the default VOC content provided by the air district or CARB's statewide limits.

[2] Note that CalEEMod estimates daily emissions based on the size and type of the development, the number of days that would be needed to complete the activity (CalEEMod default), and the amount of equipment that would be needed to accomplish construction (CalEEMod default).

[3] For the sake of a conservative analysis, the modeling for both project construction and operational phases account total development that is projected to exist in the Planning Area at buildout (year 2040), which includes both currently all development that would existing in the Planning Area in year 2040. This acts as a proxy for the 'worst-case scenario' for the purposes of CEQA analysis.

On-road mobile sources during construction also have the potential to generate temporary criteria air pollutant emissions through worker vehicles and haul trucks traveling to and from project sites during construction. Mobile source emissions were calculated using VMT data in the Transportation Impact Assessment developed for the proposed project (Kittelson & Associates, 2019). CalEEMod default vehicle trips and trip lengths were used.

Operational

Operation of development contemplated by the proposed General Plan would generate criteria air pollutant emissions from vehicle trips throughout the City, energy sources, such as natural gas combustion, and area sources, such as operation of landscaping equipment and use of consumer products, including solvents used in non-industrial applications which emit VOCs during their product use, such as cleaning supplies, kitchen aerosols, cosmetics and toiletries. Operational impacts were assessed for the full proposed project buildout year of 2040, inclusive of all development within Lake Forest projected to exist at that time. Daily maximum criteria air pollutant emissions were compared with the SCAQMD operational thresholds to determine the operational impacts of the proposed project.

The operational area emissions from the proposed project were estimated using the CalEEMod software. Area source emissions are based on hearth emissions, architectural coatings, landscaping equipment, and consumer product usage rates provided in CalEEMod. CalEEMod default values were used for area source emissions except that wood stoves and wood fireplaces were removed from the emissions calculations as they are not permitted within SCAQMD jurisdiction.

INTERSECTION HOTSPOT ANALYSIS

Operation of the proposed project has the potential to generate traffic congestion and increase delay times at intersections within the local study area. The pollutant of primary concern when assessing the proposed project's impacts at local intersections is carbon monoxide because an elevated concentration of CO tends to accumulate near areas of heavy traffic congestion and where average vehicle speeds are low. Tailpipe emissions are of concern when assessing localized impacts of CO along paved roads.

An adverse concentration of CO, known as a "hotspot", would occur if there was an exceedance of the NAAQS or CAAQS. SCAQMD does not currently have guidance for conducting intersection hot spot analysis. However, Caltrans has guidance for evaluating CO hot spots in their Transportation Project-Level Carbon Monoxide Protocol (CO Protocol). Detailed guidance discussing which modeling programs to use, calculating emission rates, receiver placement, calculating 1-hour and 8-hour concentrations, and utilizing background concentrations are provided in the Caltrans' CO Protocol.

The potential for the proposed project to cause or contribute to CO hotspots is evaluated by comparing project intersections' volume data from the Transportation Impact Assessment (Kittelson & Associates, 2019) with prior studies conducted by SCAQMD in support of their AQMPs and considering existing background CO concentrations.

TOXIC AIR CONTAMINANT IMPACTS (CONSTRUCTION AND OPERATIONS)

Construction and operational activities have the potential to result in health risk impacts (cancer, or other acute or chronic conditions) related to TACs exposure from airborne emissions, specifically the emissions of diesel particulate matter. Health risk from TACs exposure is a cumulative localized impact based exposure of nearby sensitive receptors to specific construction activities as well as on location to the construction and operational activities that emit TACs. To determine the magnitude of health risks associated with TACs exposure, a Health Risk Assessment (HRA) is required. HRAs include dispersion modeling of TACs and in order to determine the specific numerical cancer and non-cancer (acute and chronic) risks associated with the TACs on nearby individual receptors (including residences and workers). In order to accurately model the magnitude of TAC exposure on individual receptors, the following information is required:

- Type of TACs emitted during construction and operational activities (e.g. diesel particulate matter, benzene, acrolein, aniline, etc.) (note: there are 187 hazardous air pollutants currently regulated by the USEPA that are considered TACs);
- TACs source location(s) and configuration (note: this is typically provided by the project applicant for the operational phase via a site plan and detail on the specific project type, and for the construction phase via construction plans);
- TAC emissions rate(s);
- TAC release height(s); and
- The precise location of nearby residential and workplace receptors.

This information is incorporated into dispersion modeling software (such as AERMOD), which is used in conjunction with facility health risk assessment software (such as the Hotspots Analysis and Reporting Program, otherwise known as HARP-2). The results of such analysis provide a numerical estimate of maximum health risks, which are incorporated into the HRA (with detailed methodology and a list of assumptions provided). However, since the proposed project is a long-range planning document and therefore does not provide sufficient detail on specific development projects that would be developed as part of the proposed project (such as providing detailed information on the type, location, and sizing of potential sources of TACs such as warehouses, gasoline/diesel refueling stations, light industrial facilities, etc.), there is insufficient information available at this level of analysis to conduct a reasonable or scientifically valid analysis of TACs. Specific development projects in Lake Forest that have the potential to generate potentially significant risks associated with the release of TACs are required to undergo an analysis of their potential health risks associated with TACs, based upon the specific details of each individual project.

Overall, because there are no specific development projects identified or approved under the General Plan Update, the location of the development projects, and the exact nature of the development are unknown, determining health risk as this time is speculative. Therefore, the analysis of TAC health risk is discussed qualitatively in this analysis.

IMPACTS AND MITIGATION MEASURES

Impact 3.3-1: General Plan implementation would not conflict with or obstruct implementation of the applicable air quality plan (Less than Significant)

The following analysis addresses the proposed project's consistency with applicable plans and policies that govern air quality. In particular, the analysis addresses consistency with the SCAQMD's AQMP, which is an air quality plan that includes strategies for achieving attainment of applicable ozone, PM_{10}, and $PM_{2.5}$ standards.

As discussed above, the SCAQMD has adopted a series of AQMPs to lead the Air Basin into compliance with several criteria air pollutant standards and other federal requirements, while taking into account construction and operational emissions associated with population and economic growth projections provided by the SCAG's 2016 RTP/SCS (SCAG, 2016). The SCAQMD recommends that, when determining whether a project is consistent with the relevant AQMPs, the lead agency should assess whether the project would directly obstruct implementation of the plans by impeding the SCAQMD's efforts to achieve attainment with respect to any criteria air pollutant for which it is currently not in attainment of the NAAQS and CAAQS (e.g., ozone, PM_{10}, and $PM_{2.5}$) and whether it is consistent with the demographic and economic assumptions (typically land use related, such as employment and population/residential units) upon which the plan is based. The SCAQMD guidance indicates that projects whose growth is included in the projections used in the formulation of the AQMP are considered to be consistent with the plan and would not interfere with its attainment.

The SCAQMD thresholds for construction and operational emissions are designed for the analysis of individual projects and not for long-term planning documents, such as the Lake Forest General Plan Update, which will be implemented over a 20-year period. Emissions are dependent on the exact size, nature, and location of an individual land use type, combined with reductions in localized impacts from the removal of existing land use types, as applicable (i.e. conversion of light industrial uses). Emissions associated with the operation of individual projects, could exceed project-specific thresholds established by the SCAQMD.

CEQA requires that general plans be evaluated for consistency with the AQMP. Because the AQMP strategy is based on projections from local general plans, only new or amended general plan elements, specific plans, or individual projects under the general plan need to undergo a consistency review. Projects considered consistent with the local general plan are consistent with the air quality-related regional plan. Indicators of consistency include:

- Control Strategies: Whether implementation of a project would increase the frequency or severity of existing air quality violations; would cause or contribute to new violations; or would delay the timely attainment of AAQS or interim emissions reductions within the AQMP.

- Growth Projections: Whether implementation of the project would exceed growth assumptions within the AQMP, which in part, bases its strategy on growth forecasts from local general plans.

CONSTRUCTION

Control Strategies

The Air Basin is designated nonattainment for ozone and $PM_{2.5}$ under the CAAQS and NAAQS, and nonattainment for PM_{10} under the CAAQS. The proposed project involves long-term growth associated with buildout of the City of Lake Forest. Therefore, the emissions of criteria pollutants associated with future developments under the proposed project could exceed the SCAQMD thresholds for criteria pollutants. Future development of individual projects under the proposed project would be required to comply with the CARB's requirements to minimize short-term emissions from on-road and off-road diesel equipment, including the ATCM to limit heavy-duty diesel motor vehicle idling to no more than 5 minutes at any given time, and with the SCAQMD's regulations such as Rule 403 for controlling fugitive dust and Rule 1113 for controlling VOC emissions from architectural coatings. Furthermore, as applicable to the type of growth, individual projects under the proposed General Plan would comply with fleet rules to reduce on-road truck emissions (i.e., 13 CCR, Section 2025 (CARB Truck and Bus regulation)). Compliance with these measures and requirements would be consistent with and meet or exceed the AQMP requirements for control strategies intended to reduce emissions from construction equipment and activities. Therefore, the construction anticipated by the proposed would be consistent with the AQMP under the first indicator.

Growth Projections

The proposed project would result in an increase in short-term employment compared to existing conditions. The proposed project will involve construction, but the project will not necessarily create new construction jobs, since construction-related jobs generated by the proposed project would likely be filled by employees within the construction industry within the City of Lake Forest and the greater Orange County region. Construction industry jobs generally have no regular place of business, as construction workers commute to job sites throughout a given region, which may change several times a year. Moreover, these jobs would be temporary in nature. Therefore, the construction jobs generated by the proposed project would not conflict with the long-term employment or population projections upon which the AQMPs are based.

OPERATION

Control Strategies

Future development under the proposed project would be required to comply with CARB motor vehicle standards, the SCAQMD regulations for stationary sources and architectural coatings, Title 24 energy efficiency standards, and, to the extent applicable, the 2016 RTP/SCS.

As discussed above, the AQMP includes land use and transportation strategies from the 2016 RTP/SCS that are intended to reduce VMT and resulting regional mobile source emissions. The applicable land use strategies include: planning for growth around livable corridors; providing

more options for short trips/neighborhood mobility areas; supporting zero emission vehicles and expanding vehicle charging stations; and supporting local sustainability planning. The applicable transportation strategies include: managing through the Transportation Demand Management (TDM) Program and the Transportation System Management (TSM) Plan including advanced ramp metering, and expansion and integration of the traffic synchronization network; promoting active transportation. The majority of the transportation strategies are to be implemented by cities, counties, and other regional agencies such as the SCAG and the SCAQMD, although some can be furthered by individual development projects.

The location, design, and land uses of the growth anticipated by the proposed project would implement land use and transportation strategies related to reducing vehicle trips for residents and employees of the City by increasing commercial and residential density near public transit with the new land use designations such as Town Center Mixed-Use, Neighborhood Mixed-Use, and Transit-Oriented Mixed-Use. The City of Lake Forest is served by the Orange County Transportation Authority (OCTA). OCTA provides bus service in Orange County. It connects Lake Forest with several nearby cities (including Santa Ana, Mission Viejo, Irvine, and Laguna Hills) and several regional destinations such as John Wayne Airport and Irvine Station. OCTA also provides paratransit service through its ACCESS Service. In addition, transit riders can access Metrolink and Amtrak commuter rail services in nearby Irvine and Mission Viejo. There are also a number of park and ride lots in and adjacent to Lake Forest, most of which provide access to OCTA bus routes. A significant portion of the bus stops in the City of Lake Forest have a bench or a shaded bus shelter. The availability of public transportation and the focus on increasing density relative to the existing public transportation, enables the proposed project to potentially reduce vehicle trips, VMT, and associated transportation-related emissions per capita, compared to the existing conditions. Therefore, the General Plan Update would result in a less than significant impact associated with air quality. The proposed project would be consistent with the AQMP under the first indicator.

Growth Projections

The emissions inventory for the South Coast Air Basin is formed, in part, by existing city and county general plans. The AQMP is based on population, employment and VMT forecasts by the SCAG. A project might be in conflict with the AQMP if the development is greater than that anticipated in the local general plan and the SCAG's growth projections. Future development in the City of Lake Forest that is consistent with the General Plan Update would increase vehicle trips and VMT that would result in emissions of ozone precursors and particulate matter. Individual projects under the General Plan Update would be required to undergo subsequent environmental review pursuant to CEQA, and would be required to demonstrate compliance with the AQMP. Individual projects would also be required to demonstrate compliance with the SCAQMD rules and regulations governing air quality.

The City of Lake Forest continues to coordinate with the SCAQMD and the SCAG to ensure city-wide growth projections, land use planning efforts, and local development patterns are accounted for in the regional planning and air quality planning processes. Therefore, the operation of the proposed General Plan Update would not conflict with or obstruct the implementation of the applicable air quality plan. Therefore, this impact is **less than significant**. Because impacts are less

than significant, no mitigation measures are required. Nonetheless, the proposed General Plan includes policies and actions that when implemented will minimize potential impacts to air quality.

GENERAL PLAN POLICIES AND ACTIONS THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

RR-4.8: Local Reduction Targets. The City of Lake Forest establishes the following per capita GHG reduction targets, in order to meet the requirements established by the state under AB 32 and SB 32, consistent with the CARB's 2017 Scoping Plan:

- *3.99 MT CO_2e per capita by 2030*
- *2.66 MT CO_2e per capita by 2040; and*
- *1.33 MT CO_2e per capita by 2050.*

RR-4.9: GHG Reduction. Consider and adopt new policies and programs that will help to provide energy efficient alternatives to fossil fuel use and reduce consumption in order to reduce greenhouse gas emissions.

RR-4.10: Carbon Reduction. Expand the number of parks and trees in Lake Forest to provide a larger carbon sink or area containing natural sources that retain more carbon than what those sources emit.

PS-7.10: Leadership. Demonstrate leadership in local climate planning efforts through a range of tangible actions and policies at the municipal operations level.

ACTIONS

RR-4a: Review all new industrial and commercial development projects for potential air quality impacts to residences and other sensitive receptors. Ensure that mitigation measures and best management practices are implemented to reduce significant emissions of criteria pollutants.

RR-4b: Review development, infrastructure, and planning projects for consistency with SCAQMD requirements during the CEQA review process. Require project applicants to prepare air quality analyses to address SCAQMD and General Plan requirements, which include analysis and identification of:

1. *Air pollutant emissions associated with the project during construction, project operation, and cumulative conditions.*
2. *Potential exposure of sensitive receptors to toxic air contaminants.*
3. *Significant air quality impacts associated with the project for construction, project operation, and cumulative conditions.*
4. *Mitigation measures to reduce significant impacts to less than significant or the maximum extent feasible where impacts cannot be mitigated to less than significant.*

RR-4c: Work with Orange County and the South Coast Air Quality Management District to implement programs aimed at improving regional air quality.

RR-4d: Continue to review development projects to ensure that all new public and private development complies with the California Code of Regulations (CCR), Title 24 standards as well as the energy efficiency standards established by the Lake Forest Municipal Code.

RR-4e: Monitor GHG emissions generated by the community over time for consistency with the established GHG reduction targets, and update the City's community GHG Inventory every five years. In the event that the City determines that ongoing efforts to reduce GHG emissions are not on track to meet the City's adopted GHG reduction targets, the City shall establish and adopt new and/or revised GHG reductions measures that will effectively meet the established GHG reduction targets.

RR-4f: Explore the feasibility of providing the necessary facilities and infrastructure to facilitate the use of City-owned low or zero-emission vehicles such as electric vehicle charging facilities and conveniently located alternative fueling stations.

RR-4g: Evaluate and consider multi-modal transportation benefits to all City employees, such as free or low-cost monthly transit passes. Encourage employer participation in similar programs. Encourage new transit/shuttle services and use.

RR-4h: Evaluate and consider the feasibility of allowing private bicycle rental companies to operate in Lake Forest.

RR-4i: Encourage community car-sharing and carpooling.

RR-4j: Support the establishment and expansion of a regional network of electric vehicle charging stations and encourage the expanded use of electric vehicles.

RR-4k: Establish standards and requirements for electric vehicle parking, including the installation of electric vehicle charging stations, in new development projects.

RR-4l: Periodically review and update the City's Green Building Program to reflect best practices, such as encouraging the use of cement substitutes and recycled building materials for new construction.

RR-4m: Update the City's Green Building Program to promote the reduction of urban heat islands through vegetation management and cool surfaces. Encourage multi-family residential and non-residential development to increase the use of higher-albedo materials for surfaces including roofs, parking areas, driveways, roads, and sidewalks. Encourage developments with parking lot areas to shade these areas with vegetation or solar panels when appropriate. Support various programs to plant and maintain trees, which can also contribute to a reduction of urban heat islands.

PS-7a: Provide information and resources to the public and businesses regarding steps the City is taking to address the issue of climate change.

PS-7b: Study the transition to energy-efficient street lights, such as LEDs, for City-owned light facilities.

PS-7c: Consider purchasing only electric or alternative-energy vehicles for the City vehicle fleet, as appropriate, based on the intended use of the vehicle.

PS-7d: Evaluate the feasibility for government-constructed and/or -operated new development to exceed the CalGreen Tier 1, or successor program, standards.

PS-7e: Promote the use of sustainable and carbon-neutral energy sources in new development as directed in the City's Green Building Program.

PS-7f: Explore using renewable energy and clean generation technologies such as solar, wind, biogas, or fuel cells to power City facilities where appropriate.

Impact 3.3-2: General Plan implementation would result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard (Significant and Unavoidable)

Ozone, NO_2, VOC and PM_{10} and $PM_{2.5}$ are pollutants of concern, as the SCAB has been designated as a nonattainment area for State ozone, PM_{10} and $PM_{2.5}$ and as a federal nonattainment area for ozone and PM_{10}. The SCAB is currently in attainment and/or unclassified for State and Federal CO, SOx, NO_2, lead and federal attainment for PM_{10}. The SCAQMD has established numerical significance thresholds for regional emissions during construction and operation. The numerical significance thresholds are based on the recognition that the Basin is a distinct geographic area with a critical air pollution problem for which ambient air quality standards have been promulgated to protect public health (SCAQMD, 1993). The proposed project would potentially cause or contribute to an exceedance of an ambient air quality standard if the following would occur:

Regional construction emissions from both direct and indirect sources would exceed any of the following SCAQMD prescribed daily emissions thresholds (SCAQMD, 2019):

- 75 pounds a day for VOC;
- 100 pounds per day for NOx;
- 150 pounds per day for PM_{10}; and
- 55 pounds per day for $PM_{2.5}$.

Regional operational emissions exceed any of the following SCAQMD prescribed daily emissions thresholds (SCAQMD, 2019):

- 55 pounds a day for VOC;
- 55 pounds per day for NOx;
- 150 pounds per day for PM_{10}; and
- 55 pounds per day for $PM_{2.5}$.

CONSTRUCTION

Construction of the growth anticipated by the proposed General Plan has the potential to temporarily emit criteria air pollutant emissions through the use of heavy-duty construction equipment, and through vehicle trips generated by workers and haul trucks. In addition, fugitive dust emissions would result from demolition and various soil-handling activities. Mobile source emissions, primarily NOx and PM emissions (i.e., PM_{10} and $PM_{2.5}$), would result from the use of diesel-powered on- and off-road vehicles and equipment. Construction emissions can vary substantially from day-to-day, depending on the level of activity and the specific type of construction activity.

Information regarding the specific development projects and location of receptors for those projects is required in order to model specific emissions throughout the buildout horizon. Construction activities are anticipated to occur at various levels throughout the 20-year buildout horizon (2020 to 2040). Since specific projects are unknown at this time, as is the level of intensity of construction over the 20 years, the analysis provides emissions from an anticipated reasonable worst-case construction scenario. Specifically, emissions were modeled for all development within the Planning Area in buildout year 2040.[4]

As detailed in the methodology section above, daily emissions were estimated for the construction of the land uses provided in Table 2.0-3 of Chapter 2.0: Project Description ("Planning Area Buildout Potential"). Detailed information on modeling parameter inputs and other calculations are provided in Appendix C. The results of the criteria air pollutant calculations are presented in Table 3.3-6. The calculations used to develop construction emissions incorporate compliance with applicable dust control measures required to be implemented during each phase of construction by SCAQMD Rule 403 (Control of Fugitive Dust), and fugitive VOC control measures required to be implemented by architectural coating emission factors based on SCAQMD Rule 1113 (Architectural Coatings).

As shown in Table 3.3-6, construction-related daily emissions would exceed the SCAQMD significance thresholds for VOCs. Therefore, short-term regional construction emissions would be **potentially significant**.

[4] Note that this approach provides an overestimate of the emissions generated by the proposed project within the Planning Area (since it models total development that is projected to exist within the Planning Area in 2040, including development that currently exists and would continue to exist in 2040). This approach to estimated proposed project emissions provides a proxy for the 'worst-case scenario' for the purposes of CEQA analysis.

TABLE 3.3-6: MAXIMUM REGIONAL CONSTRUCTION EMISSIONS (POUNDS/DAY)

SOURCE	*VOC*	*NOX*	*CO*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
Maximum Daily Emissions	**859.4**	**46.5**	**31.5**	**0.1**	**51.9**	**12.0**
SCAQMD Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Above Threshold?	**Y**	**N**	**N**	**N**	**N**	**N**

SOURCE: CALEEMOD (V.2016.3.2)

OPERATION

Operation of the proposed project would generate criteria air pollutant emissions from project-generated vehicle trips traveling within the City, energy sources such as natural gas combustion, and area sources such as landscaping equipment and consumer products usage. The on-road mobile sources related to the operation of the proposed project include passenger vehicles, onsite use of off-road equipment and delivery trucks. VMT data, takes into account ridership, mode, and distance on freeways and local streets as provided in Section 3.14: Transportation. Projected emissions resulting from operational activities of the proposed project are presented in Table 3.3-7.

TABLE 3.3-7: MAXIMUM REGIONAL OPERATIONAL EMISSIONS (POUNDS/DAY)

SOURCE	*VOC*	*NOX*	*CO*	*SO_2*	*PM_{10}*	*$PM_{2.5}$*
Maximum Daily Emissions	**3,233.5**	**5,527.7**	**20,820.3**	**58.2**	**5,126.1**	**1,444.1**
SCAQMD Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Above Threshold?	**Y**	**Y**	**Y**	**N**	**Y**	**Y**

SOURCE: CALEEMOD (V.2016.3.2)

As identified in Table 3.3-7, operational emissions for the proposed project would exceed regulatory thresholds for VOC, NOx, CO, PM_{10}, and $PM_{2.5}$. While these thresholds are the only thresholds available for numerically determining significance, it should be noted that these thresholds were specifically developed for use in determining significance for individual projects and not for program-level documents, such as the General Plan. However, as emissions for VOC, NOx, PM_{10}, and $PM_{2.5}$ exceed regulatory thresholds, the regional operational emissions would be **potentially significant**.

CONCLUSION

The exact level of construction emissions from the development anticipated by the proposed project cannot be quantified without full detail of the development projects to be implemented and the extent to which mitigation can be applied. Individual projects anticipated by the proposed project will be required to implement their own environmental review. The proposed policies and actions of the General Plan listed below would potentially reduce emissions, which could potentially address impacts related to conflicts with an applicable air quality plan. These policies and actions are oriented toward the reduction of the air quality impacts of individual projects.

With respect to operational emissions, future development under the General Plan Update would be required to comply with AQMP, SIP, CARB, SCAQMD regulations, Title 24 energy efficiency standards, and the proposed project policies and actions. However, as there is no way to determine the effectiveness of such regulations, policies, and actions for individual projects, it is impossible to determine if potential impacts would be reduced to below regulatory thresholds. Like for construction emissions, the policies and actions of the General Plan listed below would potentially reduce operational emissions.

There are no feasible criteria air pollutant reduction measures beyond those identified within the policies and actions listed above under Impact 3.3-1 and those listed below, that would reduce impacts. While implementation of these policies and actions would reduce criteria pollutant emissions, the extent to which the impacts would have to be determined on a project-by-project basis, as necessary. Therefore, this impact is **significant and unavoidable**.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

See the policies and actions listed under Impact 3.3-1. Additionally, the following actions would further reduce criteria pollutant emissions:

RR-4n: Future development projects implemented under the General Plan will be required to demonstrate consistency with SCAQMD construction emission thresholds. Where emissions from individual projects exceed SCAQMD thresholds, the following actions shall be incorporated as necessary to minimize impacts. These measures do not exclude the use of other, equally effective mitigation measures.

- *Require all off-road diesel equipment greater than 50 horsepower (hp) used for this Project to meet USEPA Tier 4 final off-road emission standards or equivalent. Such equipment shall be outfitted with Best Available Control Technology (BACT) devices including a California Air Resources Board certified Level 3 Diesel Particulate Filter (DPF) or equivalent. This DPF will reduce diesel particulate matter and NOx emissions during construction activities.*
- *Require a minimum of 50 percent of construction debris be diverted for recycling.*
- *Require building materials to contain a minimum 10 percent recycled content.*
- *Require materials such as paints, primers, sealants, coatings, and glues to have a low volatile organic compound concentration compared to conventional products. If low VOC materials are not available, architectural coating phasing should be extended sufficiently to reduce the daily emissions of VOCs.*

RR-4o: Future development projects implemented under the General Plan will be required to demonstrate consistency with SCAQMD's operational emission thresholds. For projects where operational emissions exceed regulatory thresholds, the following measures may be used to reduce impacts. Note the following measures are not all inclusive and developers have the option to add or substitute measures that are equally or more appropriate for the scope of their project.

- *Develop a project specific TDM program for residents and/or employees that provides opportunities for carpool/vanpools.*
- *Provide onsite solar/renewable energy in excess of regulatory requirements.*

- *Require that owners/tenants of non-residential or multi-family residential developments use architectural coatings that are 10 grams per liter or less when repainting/repairing properties.*
- *Require dripless irrigation and irrigation sensor units that prevent watering during rain storms.*
- *Ensure all parking areas are wired capability of future EV charging and include EV charging stations that exceed regulatory requirements.*

Impact 3.3-3: General Plan implementation would expose sensitive receptors to substantial pollutant concentrations (Significant and Unavoidable)

Criteria air pollutant emissions have the potential to result in health impacts on sensitive receptors located near new development within the Planning Area. As discussed previously, localized impacts are associated with onsite activities. In addition to these localized impacts, vehicle travel associated with the proposed project has the potential to result in exposure of sensitive receptors to CO emissions from intersection congestion. Based on the nature and extent of new development, nearby sensitive receptors could be exposed to levels of toxic air contaminants that could result in a potential increase in cancer, acute, and/or chronic risk. The proposed project would potentially cause a significant impact if one of the following would occur:

Localized emissions from NO_2 and CO for the proposed project, when combined with existing ambient concentrations, would exceed the CAAQS.

Localized emissions from PM_{10} and $PM_{2.5}$ would result in exceedance of the following incremental increase thresholds:

- 10.4 µg/m^3 (24-hour) and 1 µg/m^3 of PM_{10} (Annual) for construction;
- 10.4 µg/m^3 (24-hour) of $PM_{2.5}$ for construction;
- 2.5 µg/m^3 (24-hour) and 1.0 µg/m^3 (Annual) of PM_{10} for operations; and
- 2.5 µg/m^3 (24-hour) of $PM_{2.5}$ for operation.

Buildout of the proposed project would emit carcinogenic materials or TACs that exceed the maximum incremental cancer risk of ten in one million or an acute or chronic hazard index of 1.0; or if cancer burden corresponds to an increase in more than 0.5 excess cancer cases in areas where the Project-related increase in individual cancer risk exceeds 1 in one million.

LOCAL AIR QUALITY

The SCAQMD recommends the evaluation of localized air quality impacts on sensitive receptors in the immediate vicinity of project-specific level proposed projects (following the SCAQMD Localized Significant Threshold, or LST, methodology). However, the SCAQMD explicitly advises that the LST methodology is not applicable to regional projects such as General Plans. Therefore, an analysis of localized emissions during construction activities is not provided herein. Because the exact nature, location, and operation of the future developments are unknown, quantification of potential

localized operational risk would be speculative. However, as construction and operation of these future developments will occur within close proximity to sensitive receptors, there is the potential for localized emissions to exceed regulatory levels. Therefore, localized construction and operational emissions with respect to the proposed project would be **potentially significant**.

INTERSECTION HOTSPOT ANALYSIS

The potential for the proposed project to cause or contribute to CO hotspots is evaluated by comparing project intersections (both intersection geometry and traffic volumes) with prior studies conducted by the SCAQMD in support of their AQMPs and considering existing background CO concentrations. As discussed below, this comparison demonstrates that the proposed project would not cause or contribute considerably to the formation of CO hotspots, that CO concentrations at project impacted intersections would remain well below the ambient air quality standards, and that no further CO analysis is warranted or required.

CO levels in the Planning Area are substantially below the Federal and State standards. CO levels decreased dramatically in the Air Basin with the introduction of the catalytic converter in 1975. No exceedances of CO have been recorded at monitoring stations in the Air Basin for some time and the Air Basin is currently designated as a CO attainment area for both the CAAQS and NAAQS. Thus, it is not expected that CO levels within the Planning Area at project-impacted intersections would rise to the level of an exceedance of these standards.

Additionally, the SCAQMD conducted CO modeling for the 2003 AQMP for the four worst-case intersections in the Air Basin: (1) Wilshire Boulevard and Veteran Avenue; (2) Sunset Boulevard and Highland Avenue; (3) La Cienega Boulevard and Century Boulevard; and (4) Long Beach Boulevard and Imperial Highway. Based on the intersection volumes identified in the 2003 AQMP, if a project's traffic levels exceed 100,000 vehicles per day at any proposed project-impacted intersection, there would be the potential for significant impacts and dispersion modeling would need to be conducted to determine project level impacts.

As provided within the data provided within the Transportation Impact Analysis developed by Kittelson & Associates, there are no intersections would exceed 100,000 vehicles per day within the Planning Area. As a result, CO concentrations are expected to be less than those estimated in the 2003 AQMP, which would not exceed the applicable thresholds. Thus, this comparison demonstrates that the proposed project would not contribute considerably to the formation of CO hotspots and no further CO analysis is required. The proposed project would result in **less than significant** impacts with respect to CO hotspots.

TOXIC AIR CONTAMINANTS

Construction and operation of the proposed project would result in emissions of TACs, predominantly from diesel particulate emissions from on- and off-road vehicles during construction and from the operation of diesel fueled equipment or generators during operational activities. Because the exact nature, location, and operation of the future developments are unknown, and because health risk impacts from TACs are cumulative over the life of the nearby

receptors, quantification of potential health risks would be speculative. However, as construction and operation of these future developments will occur within close proximity to sensitive receptors, there is the potential for risk to exceed regulatory levels. Therefore, health risks with respect to the development anticipated by the proposed project would be **potentially significant**.

HEALTH IMPACTS

Because regional emissions exceed the SCAQMD regulatory thresholds during construction and operational activities, there is the potential that these emissions would exceed the CAAQS and NAAQS thus resulting in a health impact. Without knowing the exact specifications for all projects that may be developed under the General Plan Update, there is no way to accurately calculate the potential for health impacts from the overall General Plan Update. Individual projects will be required to provide their own environmental assessments to determine health impacts from the construction and operation of their projects. Because there is no way to determine the potential for these projects to affect health of sensitive receptors within the City of Lake Forest, the proposed project would result in **potentially significant** health impacts.

The proposed policies of the General Plan listed below would potentially reduce emissions, which could potentially reduce impacts related to conflicts with an applicable air quality plan.

CONCLUSION

With respect to local air quality emissions, toxic air contaminant emissions, and health impacts, future development under the General Plan would be required to comply with AQMP, SIP, CARB, SCAQMD regulations, Title 24 energy efficiency standards, and the proposed General Plan policies and actions. Implementation of the policies and actions listed below would mitigate and reduce such emissions. However, the exact location, type, nature, and size of future projects that may expose sensitive receptors to pollutant concentrations cannot be calculated at this time, as the details of potential future projects are not currently known. As such, there is no way to determine the extent to which these regulations will be, or need to be, implemented, and it is impossible to determine if potential impacts would be reduced to below regulatory thresholds. Additionally, there are no feasible mitigation measures beyond the policies and actions listed below. Therefore, localized operational impacts, construction and operational health and toxic air impacts would remain **significant and unavoidable**.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

See the policies and actions provided under Impact 3.3-1 and Impact 3.3-2.

Impact 3.3-4: General Plan implementation would result in other emissions (such as those leading to odors adversely affecting a substantial number of people) (Significant and Unavoidable)

The proposed project would have a potentially significant odor impact if it results in odors that affect a substantial number of people. Further the proposed project could potentially cause or

contribute to an exceedance of an ambient air quality standard with respect to CO and SOx, if the following would occur:

Regional construction emissions from both direct and indirect sources would exceed any of the following SCAQMD prescribed daily emissions thresholds (SCAQMD, 2019):

- 550 pounds per day for CO;
- 150 pounds per day for SOx.

Regional operational emissions exceed any of the following SCAQMD prescribed daily emissions thresholds (SCAQMD, 2019):

- 550 pounds per day for CO;
- 150 pounds per day for SOx.

CONSTRUCTION

Odors

Potential sources that may emit odors during construction activities include the use of architectural coatings and solvents. SCAQMD Rule 1113 (Architectural Coatings) limits the amount of VOCs from architectural coatings and solvents. According to the SCAQMD *CEQA Air Quality Handbook*, construction equipment is not a typical source of odors. Odors from the combustion of diesel fuel would be minimized by complying with the CARB ATCM that limits diesel-fueled commercial vehicle idling to 5 minutes at any given location, which was adopted in 2004. The proposed project would also comply with SCAQMD Rule 402 (Nuisance), which prohibits the emissions of nuisance air contaminants or odorous compounds. Through adherence with mandatory compliance with SCAQMD Rules and State measures, construction activities and materials would not create objectionable odors. Construction of the proposed project would not be expected to generate nuisance odors at nearby air quality sensitive receptors. Therefore, impacts with respect to odors would be **less than significant**.

Regional Emissions

Table 3.3-6, under Impact 3.3-2, details the proposed project's emissions with attainment pollutants CO and Sox during construction activities. As shown, construction-related daily emissions would not exceed the SCAQMD significance thresholds for these attainment pollutants. Therefore, short-term regional construction emissions would be **less than significant**.

OPERATION

Odors

The proposed growth in residential, office, retail/restaurant, commercial, and park land uses and are not expected to introduce substantial sources of other emissions, including odors. According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project is not

expected to include elements related to these types of uses. The proposed project would include various trash receptacles. On-site trash receptacles used by the proposed project would be covered and properly maintained to prevent adverse odors. With proper housekeeping practices, trash receptacles would be maintained in a manner that promotes odor control, and no adverse odor impacts are anticipated from the uses. Therefore, impacts with respect to odors would be **less than significant**.

Regional Emissions

As identified in Table 3.3-7, under Impact 3.3-2, operational emissions for the proposed project would exceed regulatory thresholds for CO. Emissions of SOx are well below regulatory thresholds. While these thresholds are the only thresholds available for numerically determining significance, it should be noted that these thresholds were specifically developed for use in determining significance for individual projects and not for program level documents such as the General Plan. However, as emissions for CO exceed regulatory thresholds, the regional operational emissions would be **potentially significant**.

The proposed policies of the General Plan listed below would potentially reduce emissions, which would potentially reduce impacts related to conflicts with an applicable air quality plan.

CONCLUSION

With respect to other emissions, future development under the proposed General Plan would be required to comply with AQMP, SIP, CARB, SCAQMD regulations, Title 24 energy efficiency standards, and the proposed General Plan policies and actions. Implementation of the policies and actions listed below would such emissions. However, the exact location, type, nature, and size of future projects that may expose sensitive receptors to pollutant concentrations cannot be calculated at this time, as the details of potential future projects are not currently known. As such, there is no way to determine the extent to which these regulations will be, or need to be, implemented, and it is impossible to determine if potential impacts would be reduced to below regulatory thresholds. Additionally, there are no feasible mitigation measures beyond the policies and actions listed below. Therefore, localized operational impacts, construction and operational health and toxic air impacts would remain **significant and unavoidable**.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

See the policies and actions listed under Impact 3.3-1 and Impact 3.3-2.

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This section describes biological resources in the Planning Area. This section provides a background discussion of the bioregions, regionally important habitat and wildlife, and special status species found in the vicinity of Lake Forest. This section is organized with an environmental setting, regulatory setting, and impact analysis.

No comments on this environmental topic were received during the NOP comment period.

KEY TERMS

The following key terms are used throughout this section to describe biological resources and the framework that regulates them:

Hydric Soils. One of the three wetland identification parameters, according to the Federal definition of a wetland, hydric soils have characteristics that indicate they were developed in conditions where soil oxygen is limited by the presence of saturated soil for long periods during the growing season. There are approximately 2,000 named soils in the United States that may occur in wetlands.

Hydrophytic Vegetation. Plant types that typically occur in wetland areas. Nearly 5,000 plant types in the United States may occur in wetlands. Plants are listed in regional publications of the U.S. Fish and Wildlife Service (USFWS) and include such species as cattails, bulrushes, cordgrass, sphagnum moss, bald cypress, willows, mangroves, sedges, rushes, arrowheads, and water plantains.

Sensitive Natural Community. A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, State, or Federal agencies. The California Environmental Quality Act (CEQA) identifies the elimination or substantial degradation of such communities as a significant impact. The California Department of Fish and Wildlife (CDFW) tracks sensitive natural communities in the California Natural Diversity Database (CNDDB).

Special-Status Species. Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by Federal, State, or other agencies. Some of these species receive specific protection that is defined by Federal or State endangered species legislation. Others have been designated as "sensitive" on the basis of adopted policies and expertise of State resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. These species are referred to collectively as "special status species" in this report, following a convention that has developed in practice but has no official sanction. For the purposes of this assessment, the term “special status” includes those species that are:

- Federally listed or proposed for listing under the Federal Endangered Species Act (50 CFR 17.11-17.12);
- Candidates for listing under the Federal Endangered Species Act (61 FR 7596-7613);

- State listed or proposed for listing under the California Endangered Species Act (14 CCR 670.5);
- Species listed by the USFWS or the CDFW as a species of concern (USFWS), rare (CDFW), or of special concern (CDFW);
- Fully protected animals, as defined by the State of California (California Fish and Game Code Section 3511, 4700, and 5050);
- Species that meet the definition of threatened, endangered, or rare under CEQA (CEQA Guidelines Section 15380);
- Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.); and
- Plants listed by the California Native Plant Society (CNPS) as rare, threatened, or endangered (List 1A and List 2 status plants in Skinner and Pavlik 1994).

Waters of the U.S. The Federal government defines waters of the U.S. as "lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows" [33 C.F.R. §328.3(a)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the U.S. Army Corps of Engineers (USACE) as “that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” [33 C.F.R. §328.3(e)].

Wetlands. Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The Federal government defines wetlands as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” [33 C.F.R. §328.3(b)]. Wetlands require wetland hydrology, hydric soils, and hydrophytic vegetation. Examples of wetlands include freshwater marsh, seasonal wetlands, and vernal pool complexes that have a hydrologic link to waters of the U.S.

3.4.1 ENVIRONMENTAL SETTING

Lake Forest is bordered to its north and northeast by the Santa Ana Mountains/County of Orange, the City of Mission Viejo to the east, the City of Laguna Hills to the south, and the City of Irvine to the west. Terrain in the City of Lake Forest ranges from the Saddleback Valley in the southern part of the City, to low hills in the north that lead up to the foothills of the Santa Ana Mountains further north of the City. Much of the City of Lake Forest has a gentle southwest slope, with elevations ranging from approximately 300 feet above mean sea level (amsl) at the southwestern corner of the City to approximately 1,500 feet amsl at the northern end of the City.

BIOREGIONS

Lake Forest is located within the South Coast bioregion. Landscapes in this bioregion range from flatlands to mountains; ecosystems range from ocean to desert. The City is bounded on the north by the southern edge of Los Padres National Forest and the northern base of the San Gabriel and San Bernardino Mountains and bounded on the east by the western edge of the BLM California Desert Conservation Area and on south by the Mexican border. The region also contains two of

California's largest cities (Los Angeles and San Diego). Past and ongoing urbanization in the South Coast bioregion has caused intense impacts to natural resources. Urbanization in the South Coast bioregion has resulted in the loss of habitat, spread of nonnative species and the loss of native species.

CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM

The California Wildlife Habitat Relationship (CWHR) habitat classification scheme has been developed to support the CWHR System, a wildlife information system and predictive model for California's regularly-occurring birds, mammals, reptiles and amphibians. When first published in 1988, the classification scheme had 53 habitats. At present, there are 59 wildlife habitats in the CWHR System: 27 tree, 12 shrub, 6 herbaceous, 4 aquatic, 8 agricultural, 1 developed, and 1 non-vegetated.

According to the California Wildlife Habitat Relationship System there are 12 cover types (wildlife habitat classifications) in the City of Lake Forest out of 59 found in the State. These include: Annual Grassland, Barren, Chamise-Redshank Chaparral, Coastal Oak Woodland, Coastal Scrub, Deciduous Orchard, Evergreen Orchard, Lacustrine, Mixed Chaparral, Pasture, Urban, and Valley Foothill Riparian.

Table 3.4-1 identifies the total area by acreage for each cover type (wildlife habitat classification) found in Lake Forest. Figure 3.4-1 illustrates the location of each cover type (wildlife habitat classification) within Lake Forest. A brief description of each cover type follows.

TABLE 3.4-1: COVER TYPES - CALIFORNIA WILDLIFE HABITAT RELATIONSHIP SYSTEM

COVER TYPE	*ACRES WITHIN CITY*
Annual Grassland	539.17
Barren	188.07
Chamise-Redshank Chaparral	76.79
Coastal Oak Woodland	247.72
Coastal Scrub	1,366.39
Deciduous Orchard	28.71
Evergreen Orchard	128.76
Lacustrine	2.89
Mixed Chaparral	527.31
Pasture	41.81
Urban	7,448.36
Valley Foothill Riparian	146.60
Total	10,742.61

SOURCE: CITY OF LAKE FOREST GIS, CWHR 2018.

Developed Cover Types

Urban habitats are not limited to any particular physical setting. Three urban categories relevant to wildlife are distinguished: downtown, urban residential, and suburbia. The heavily-developed downtown is usually at the center, followed by concentric zones of urban residential and suburbs.

There is a progression outward of decreasing development and increasing vegetative cover. Species richness and diversity is extremely low in the inner cover. The structure of urban vegetation varies, with five types of vegetative structure defined: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. A distinguishing feature of the urban wildlife habitat is the mixture of native and exotic species. Within the City limits, there are 7,448.36 acres of urban habitat.

Deciduous Orchard in California is typically open single species tree dominated habitats. Depending on the tree type and pruning methods they are usually low, bushy trees with an open understory to facilitate harvest. Deciduous orchards include trees, such as, almonds, apples, apricots, cherries, figs, nectarines, peaches, pears, pecans, pistachios, plums, pomegranates, prunes and walnuts. Trees range in height at maturity for many species from 5 to 10 meters (m) (15 to 30 feet) (ft), but may be 3 m (10 ft) or less in pomegranates and some dwarf varieties, or 18 m (60 ft) or more in pecans and walnuts. Crowns usually touch, and are usually in a linear pattern. Spacing between trees is uniform depending on desired spread of mature trees. The understory is usually composed of low-growing grasses, legumes, and other herbaceous plants, but may be managed to prevent understory growth totally or partially, such as along tree rows. Within the City limits, there are 28.71 acres of deciduous orchard habitat.

Evergreen Orchard in California is typically open single species tree dominated habitats. Depending on the tree type and pruning methods they are usually low, bushy trees with an open understory to facilitate harvest. Evergreen orchards include trees, such as, avocados, dates, grapefruit, lemons, limes, olives, oranges, tangerines, tangelos and tangors. Trees range in height at maturity for many species from 5 to 10 m (15 to 30 ft), but may be 3 m (10 ft) or less in some dwarf varieties, or 18 m (60 ft) or more in date palms. Crowns often do not touch, and are usually in a linear pattern. Spacing between trees is uniform depending on desired spread of mature trees. The understory is usually composed of low-growing grasses, legumes, and other herbaceous plants, but may be managed to prevent understory growth totally or partially, such as along tree rows. Within the City limits, there are 128.76 acres of evergreen orchard habitat.

Herbaceous Cover Types

Annual Grassland habitat occurs mostly on flat plains to gently rolling foothills. Climatic conditions are typically Mediterranean, with cool, wet winters and dry, hot summers. The length of the frost-free season averages 250 to 300 days. Annual precipitation is highest in northern California. Within the City limits, there are 539.17 acres of annual grassland habitat.

Pasture habitats comprise a mix of perennial grasses and legumes that normally provide 100 percent canopy closure. Height of vegetation varies, according to season and livestock stocking levels, from a few inches to two or more feet on fertile soils before grazing. Pastures often occur in association with agricultural habitats. The mix of grasses and legumes varies according to management practices such as seed mixture, fertilization, soil type, irrigation, weed control, and the type of livestock on the pasture. Plan species seeded in pastures also vary with geographic area. In southern California, Bermuda grass is prevalent. Within the City limits, there are 41.81 acres of pasture habitat.

Hardwood Woodland Cover Types

Coastal Oak Woodland habitats occupy a variety of Mediterranean type climates that vary from north to south and west to east. Precipitation occurs in the milder winter months, almost entirely as rainfall, followed by warm to hot, dry summers. Near the coast, the summers are tempered by fogs and cool, humid sea breezes. Mean annual precipitation varies from about 40 inches in the north to about 15 inches in southern and interior regions. Mean minimum winter temperatures are 29 to 44 °F, and the mean maximum summer temperatures are 75 to 96 °F. The growing season ranges from six months (180 frost-free days) in the north to the entire year in mild coastal regions to the south. The soils and parent material on which coastal oak woodlands occur are extremely variable. In San Luis Obispo County alone they are found on over fifteen different parent materials ranging from unconsolidated siliceous sand to diatomaceous earth to serpentinite to volcanic ash and basalt. Coastal oak woodlands generally occur on moderately to well-drained soils that are moderately deep and have low to medium fertility. Within the City limits, there are 247.72 acres of coastal oak woodland habitat.

Valley Foothill Riparian habitats are found in valleys bordered by sloping alluvial fans, slightly dissected terraces, lower foothills, and coastal plains. They are generally associated with low velocity flows, flood plains, and gentle topography. Valleys provide deep alluvial soils and a high water table. The substrate is coarse, gravelly, or rocky soils more or less permanently moist, but probably well aerated. Frost and short periods of freezing occur in winter (200 to 350 frost-free days). This habitat is characterized by hot, dry summers and mild and wet winters. Temperatures range from 75 to 102 °F in the summer to 29 to 44 °F in the winter. Average precipitation ranges from 6 to 30 inches, with little or no snow. The growing season is 7 to 11 months. Within the City limits, there are 146.60 acres of valley-foothill riparian habitat.

Shrub-Dominated Cover Types

Coastal Scrub habitat is typified by low to moderate-sized shrubs with mesophytic leaves, flexible branches, semi-woody stems growing from a woody base, and a shallow root system. Coastal Scrub seems to tolerate drier conditions than its associated habitats. It is typical of areas with steep, south-facing slopes; sandy, mudstone or shale soils; and average annual rainfall of less than 12 inches. However, coastal scrub habitat also regularly occurs on stabilized dunes, flat terraces, and moderate slopes of all aspects where average annual rainfall is up to 24 inches. Stand composition and structure differ markedly in response to these physiographic features. Within the City limits, there are 1,366.39 acres of coastal scrub habitat.

Chamise-Redshank Chaparral habitat structure is influenced by fire. Mature Chamise-Redshank Chaparral is single layered, generally lacking well-developed herbaceous ground cover and overstory trees. Shrub canopies frequently overlap, producing a nearly impenetrable canopy of interwoven branches. Chamise-dominated stands average 1 to 2 m (3.3 to 6.6 ft) in height, but can reach 3 m (9.8 ft). Total shrub cover frequently exceeds 80 percent, but may be considerably lower on extremely xeric sites with poor soils. Redshank stands are slightly taller, averaging 2 to 4 m (6.6 to 13.1 ft) but occasionally reaching 6 m (19.7 ft). Mature redshank frequently is more open than chamise and can have sparse herbaceous cover between shrubs. Composition In southern

California includes white sage, black sage, and California buckwheat are common at lower elevations and on recently disturbed sites. Within the City limits, there are 76.79 acres of chamise-redshank chaparral habitat.

Mixed Chaparral is a structurally homogeneous brushland type dominated by shrubs with thick, stiff, heavily cutinized evergreen leaves. Shrub height and crown cover vary considerably with age since last burn, precipitation regime, aspect, and soil type. At maturity, cismontane Mixed Chaparral typically is a dense, nearly impenetrable thicket with greater than 80 percent absolute shrub cover. Mixed Chaparral is a floristically rich type that supports approximately 240 species of woody plants. Composition changes between northern and southern California and with precipitation regime, aspect, and soil type. Dominant species in cismontane Mixed Chaparral include scrub oak, chaparral oak, and several species of ceanothus and manzanita. Within the City limits, there are 527.31 acres of mixed chaparral habitat.

Aquatic Habitats

Lacustrine habitats are inland depressions or dammed riverine channels containing standing water. These habitats may occur in association with any terrestrial habitats, Riverine, or Fresh Emergent Wetlands. They may vary from small ponds less than one acre to large areas covering several square miles. Depth can vary from a few inches to hundreds of feet. Typical lacustrine habitats include permanently flooded lakes and reservoirs, and intermittent lakes and ponds (including vernal pools) so shallow that rooted plants can grow over the bottom. Most permanent lacustrine systems support fish life; intermittent types usually do not. Within the City limits, there are 2.89 acres of lacustrine habitat.

Non-Vegetated Habitats

Barren habitat is defined by the absence of vegetation, and habitat with <2% total vegetation cover by herbaceous, desert, or non- wildland species, and <10% cover by tree or shrub species. Structure and composition of the substrate is largely determined by the region of the state and surrounding environment. Urban settings covered in pavement and buildings may be classified as barren as long as vegetation, including non-native landscaping, does not reach the % cover thresholds for vegetated habitats. Within the City limits, there are 188.07 acres of barren land.

SPECIAL-STATUS SPECIES

The following discussion is based on a background search of special-status species that are documented in the California Natural Diversity Database (CNDDB), the California Native Plant Survey (CNPS) Inventory of Rare and Endangered Plants, and the USFWS endangered and threatened species lists. The background search was regional in scope and focused on the documented occurrences within a nine-quad area (approximately a 10-mile radius), and a one-mile radius. The following nine U.S. Geological Survey quads: El Toro, Orange, Black Star Canyon, Corona South, Tustin, Santiago Peak, Laguna Beach, San Juan Capistrano, and Canada Gobernadora.

Special Status Plants

The search revealed documented occurrences of 46 special status plant species within the nine quad search area. Of these 46 special status plant species within the nine quad search area, seven species were documented within one mile of Lake Forest.

Table 3.4-2 provides a list of special-status plant species that are documented within a nine quad search area (approximately a 10-mile radius) of Lake Forest, and current protective status. Figure 3.4-2 illustrates the special status species located within the nine quad search area.

TABLE 3.4-2: SPECIAL STATUS PLANTS PRESENT OR POTENTIALLY PRESENT (9 QUAD SEARCH AREA)

SCIENTIFIC NAME	*COMMON NAME*	*FEDERAL STATUS*	*STATE STATUS*	*CNPS**
Abronia villosa var. aurita	Chaparral sand-verbena	None	None	1B.1
Aphanisma blitoides	Aphanisma	None	None	1B.2
Astragalus brauntonii	Braunton's milk-vetch	Endangered	None	1B.1
Atriplex coulteri	Coulter's saltbush	None	None	1B.2
Atriplex pacifica	South coast saltscale	None	None	1B.2
Atriplex parishii	Parish's brittlescale	None	None	1B.1
Atriplex serenana var. davidsonii	Davidson's saltscale	None	None	1B.2
Baccharis malibuensis	Malibu baccharis	None	None	1B.1
Brodiaea filifolia	Thread-leaved brodiaea	Threatened	Endangered	1B.1
Calochortus plummerae	Plummer's mariposa-lily	None	None	4.2
Calochortus weedii var. intermedius	Intermediate mariposa-lily	None	None	1B.2
Centromadia parryi ssp. australis	Southern tarplant	None	None	1B.1
Chaenactis glabriuscula var. orcuttiana	Orcutt's pincushion	None	None	1B.1
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	Proposed Threatened	Endangered	1B.1
Chorizanthe polygonoides var. longispina	Long-spined spineflower	None	None	1B.2
Clinopodium chandleri	San Miguel savory	None	None	1B.2
Comarostaphylis diversifolia ssp. diversifolia	Summer holly	None	None	1B.2
Dudleya multicaulis	Many-stemmed dudleya	None	None	1B.2
Dudleya stolonifera	Laguna Beach dudleya	Threatened	Threatened	1B.1
Dudleya viscida	Sticky dudleya	None	None	1B.2
Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	Endangered	Endangered	1B.1
Euphorbia misera	Cliff spurge	None	None	2B.2
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	None	None	1A
Hesperocyparis forbesii	Tecate cypress	None	None	1B.1
Horkelia cuneata var. puberula	Mesa horkelia	None	None	1B.1
Imperata brevifolia	California satintail	None	None	2B.1
Isocoma menziesii var.	Decumbent goldenbush	None	None	1B.2

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	CNPS*
decumbens				
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	None	None	1B.1
Lepechinia cardiophylla	Heart-leaved pitcher sage	None	None	1B.2
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	None	None	4.3
Monardella hypoleuca ssp. intermedia	Intermediate monardella	None	None	1B.3
Monardella macrantha ssp. hallii	Hall's monardella	None	None	1B.3
Nama stenocarpa	Mud nama	None	None	2B.2
Nasturtium gambelii	Gambel's water cress	Endangered	Threatened	1B.1
Navarretia prostrata	Prostrate vernal pool navarretia	None	None	1B.1
Nolina cismontana	Chaparral nolina	None	None	1B.2
Penstemon californicus	California beardtongue	None	None	1B.2
Pentachaeta aurea ssp. allenii	Allen's pentachaeta	None	None	1B.1
Phacelia keckii	Santiago Peak phacelia	None	None	1B.3
Pseudognaphalium leucocephalum	White rabbit-tobacco	None	None	2B.2
Quercus dumosa	Nuttall's scrub oak	None	None	1B.1
Senecio aphanactis	Chaparral ragwort	None	None	2B.2
Sidalcea neomexicana	Salt spring checkerbloom	None	None	2B.2
Suaeda esteroa	Estuary seablite	None	None	1B.2
Symphyotrichum defoliatum	San Bernardino aster	None	None	1B.2
Verbesina dissita	Big-leaved crownbeard	Threatened	Threatened	1B.1

NOTES: CALIFORNIA NATIVE PLANT SOCIETY (CNPS) KEY:

1A CNPS – PRESUMED EXTIRPATED IN CALIFORNIA AND EITHER RARE OR EXTINCT ELSEWHERE

1B CNPS- RARE, THREATENED, OR ENDANGERED IN CALIFORNIA AND ELSEWHERE

2B CNPS - RARE, THREATENED, OR ENDANGERED IN CALIFORNIA, BUT MORE COMMON ELSEWHERE

4 CNPS - PLANTS OF LIMITED DISTRIBUTION - A WATCH LIST

RANKS AT EACH LEVEL ALSO INCLUDE A THREAT RANK (E.G. 4.3) AND ARE DETERMINED AS FOLLOWS:

0.1 – SERIOUSLY THREATENED IN CALIFORNIA (OVER 80% OF OCCURRENCES THREATENED/HIGH DEGREE AND IMMEDIACY OF THREAT)

0.2 – MODERATELY THREATENED IN CALIFORNIA (20-80% OCCURRENCES THREATENED/MODERATE DEGREE AND IMMEDIACY OF THREAT)

0.3 – NOT VERY THREATENED IN CALIFORNIA (LESS THAN 20% OF OCCURRENCES THREATENED/LOW DEGREE AND IMMEDIACY OF THREAT OR NO CURRENT THREATS KNOWN).

SOURCE: CDFW CNDDB 2018.

Special Status Animals

The search revealed documented occurrences of 65 special status animal species within the nine quad search area. This includes: three amphibians, 26 birds, six fish, 15 mammals, 10 reptiles, and five invertebrates. Of the 65 special status animal species within the nine quad search areas, 30 species are located within one mile of Lake Forest.

Table 3.4-3 provides a list of the special-status animal species that are documented within the nine quad search area, and current protective status. Figure 3.4-2 illustrates the special status species located within the nine quad search area.

TABLE 3.4-3: SPECIAL STATUS ANIMALS PRESENT OR POTENTIALLY PRESENT (9 QUAD SEARCH AREA)

SPECIES	*COMMON NAME*	*FEDERAL STATUS*	*STATE STATUS*	*CFDW STATUS*
AMPHIBIANS				
Anaxyrus californicus	Arroyo toad	Endangered	None	SSC
Lithobates pipiens	Northern leopard frog	None	None	SSC
Spea hammondii	Western spadefoot	None	None	SSC
BIRDS				
Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	FP
Haliaeetus leucocephalus	Bald eagle	Delisted	Endangered	FP
Passerculus sandwichensis beldingi	Belding's savannah sparrow	None	Endangered	--
Artemisiospiza belli	Bell's sage sparrow	None	None	WL
Athene cunicularia	Burrowing owl	None	None	SSC
Laterallus jamaicensis coturniculus	California black rail	None	Threatened	FP
Eremophila alpestris actia	California horned lark	None	None	WL
Sternula antillarum browni	California least tern	Endangered	Endangered	FP
Campylorhynchus brunneicapillus sandiegensis	Coastal cactus wren	None	None	SSC
Polioptila californica	Coastal California gnatcatcher	Threatened	None	SSC
Accipiter cooperii	Cooper's hawk	None	None	WL
Buteo regalis	Ferruginous hawk	None	None	WL
Aquila chrysaetos	Golden eagle	None	None	FP; WL
Ammodramus savannarum	Grasshopper sparrow	None	None	SSC
Ardea Herodias	Great blue heron	None	None	--
Vireo bellii pusillus	Least Bell's vireo	Endangered	Endangered	--
Rallus obsoletus levipes	Light-footed Ridgway's rail	Endangered	Endangered	FP
Asio otus	Long-eared owl	None	None	SSC
Circus cyaneus	Northern harrier	None	None	SSC
Empidonax traillii extimus	Southwestern willow flycatcher	Endangered	Endangered	--
Agelaius tricolor	Tricolored blackbird	None	Candidate Endangered	SSC
Coccyzus americanus occidentalis	Western yellow-billed cuckoo	Threatened	Endangered	--
Elanus leucurus	White-tailed kite	None	None	FP
Coturnicops noveboracensis	Yellow rail	None	None	SSC
Setophaga petechia	Yellow Warbler	None	None	SSC
Icteria virens	Yellow-breasted chat	None	None	SSC

SPECIES	*COMMON NAME*	*FEDERAL STATUS*	*STATE STATUS*	*CFDW STATUS*
FISH				
Gila orcuttii	Arroyo chub	None	None	SSC
Rhinichthys osculus	Santa Ana speckled dace	None	None	SSC
Catostomus santaanae	Santa Ana sucker	Threatened	None	--
Southern California Arroyo Chub/Santa Ana Sucker Stream	Southern California Arroyo Chub/Santa Ana Sucker Stream	None	None	--
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	None	None	WL
Eucyclogobius newberryi	Tidewater goby	Endangered	None	SSC
MAMMALS				
Taxidea taxus	American badger	None	None	SSC
Nyctinomops macrotis	Big free-tailed bat	None	None	SSC
Choeronycteris mexicana	Mexican long-tongued bat	None	None	SSC
Chaetodipus fallax	Northwestern San Diego pocket mouse	None	None	SSC
Perognathus longimembris pacificus	Pacific pocket mouse	Endangered	None	SSC
Antrozous pallidus	Pallid bat	None	None	SSC
Nyctinomops femorosaccus	Pocketed free-tailed bat	None	None	SSC
Neotoma lepida intermedia	San Diego desert woodrat	None	None	SSC
Aimophila ruficeps canescens	Southern California saltmarsh shrew	None	None	WL
Onychomys torridus ramona	Southern grasshopper mouse	None	None	SSC
Dipodomys stephensi	Stephens' kangaroo rat	Endangered	Threatened	--
Eumops perotis californicus	Western mastiff bat	None	None	SSC
Lasiurus blossevillii	Western red bat	None	None	SSC
Lasiurus xanthinus	Western yellow bat	None	None	SSC
Myotis yumanensis	Yuma myotis	None	None	--
REPTILES				
Arizona elegans occidentalis	California glossy snake	None	None	SSC
Lampropeltis zonata (pulchra)	California mountain kingsnake (San Diego population)	None	None	WL
Phrynosoma blainvillii	Coast horned lizard	None	None	SSC
Salvadora hexalepis virgultea	Coast patch-nosed snake	None	None	SSC
Taricha torosa	Coast range newt	None	None	SSC
Aspidoscelis tigris stejnegeri	Coastal whiptail	None	None	SSC
Aspidoscelis hyperythra	Orange-throated whiptail	None	None	WL
Crotalus ruber	Red-diamond rattlesnake	None	None	SSC
Thamnophis hammondii	Two-striped gartersnake	None	None	SSC
Emys marmorata	Western pond turtle	None	None	SSC

SPECIES	COMMON NAME	FEDERAL STATUS	STATE STATUS	CFDW STATUS
INVERTEBRATES				
Bombus Crotchii	Crotch bumble bee	None	None	SSC
Tryonia imitator	California brackishwater snail	None	None	--
Danaus plexippu	Monarch butterfly	None	None	--
Streptocephalus woottoni	Riverside fairy shrimp	Endangered	None	--
Branchinecta sandiegonensis	San Diego fairy shrimp	Endangered	None	--

NOTES: (--) INDICATES NO LISTING STATUS.
CDFW ABBREVIATIONS:
WL WATCH LIST
FP FULLY PROTECTED
SSC CDFW SPECIES OF SPECIAL CONCERN
SOURCE: CDFW CNDDB 2018.

Sensitive Natural Communities

The CDFW considers sensitive natural communities to have significant biotic value, with species of plants and animals unique to each community. The CNDDB search revealed 12 sensitive natural communities within the nine quad search area, with four sensitive natural communities within one mile of Lake Forest. The sensitive natural communities within the nine quad search area include the terrestrial communities of California Walnut Woodland, Canyon Live Oak Ravine Forest, Southern Coast Live Oak Riparian Forest, Southern Cottonwood Willow Riparian Forest, Southern Interior Cypress Forest, Southern Mixed Riparian Forest, Southern Riparian Forest, Southern Riparian Scrub, Southern Sycamore Alder Riparian Woodland, Southern Woodland Scrub, and Valley Needlegrass Grassland, and the aquatic community of Southern Coast Marsh.

3.4.2 REGULATORY SETTING

There are a number of regulatory agencies whose responsibility includes the oversight of the natural resources of the State and nation including the CDFW, the USFWS, the USACE, and the National Marine Fisheries Service (NMFS). These agencies often respond to declines in the quantity of a particular habitat or plant or animal species by developing protective measures for those species or habitat type. The following is an overview of the Federal, State, and local regulations that are applicable to implementing the General Plan.

FEDERAL

Federal Endangered Species Act

The Federal Endangered Species Act, passed in 1973, defines an endangered species as any species or subspecies that is in danger of extinction throughout all or a significant portion of its range. A threatened species is defined as any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Once a species is listed it is fully protected from a "take" unless a take permit is issued by the United States Fish and Wildlife Service. A take is defined as the harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct, including modification of its habitat (16 USC 1532, 50 CFR 17.3). Proposed endangered or threatened species are those species for which a proposed regulation, but not a final rule, has been published in the Federal Register.

Migratory Bird Treaty Act

To kill, posses, or trade a migratory bird, bird part, nest, or egg is a violation of the Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., §703, Supp. I, 1989), unless it is in accordance with the regulations that have been set forth by the Secretary of the Interior.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 USC Section 668) protects these birds from direct take and prohibits the take or commerce of any part of these species. The USFWS administers the act, and reviews Federal agency actions that may affect these species.

Clean Water Act – Section 404

Section 404 of the Clean Water Act (CWA) regulates all discharges of dredged or fill material into waters of the U.S. Discharges of fill material includes the placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §323.2(f)].

Waters of the U.S. include lakes, rivers, streams, intermittent drainages, mudflats, sandflats, wetlands, sloughs, and wet meadows [33 C.F.R. §328.3(a)]. Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 C.F.R. §328.3(b)]. Waters of the U.S. exhibit a defined bed and bank and ordinary high water mark (OHWM). The OHWM is defined by the USACE as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" [33 C.F.R. §328.3(e)].

The USACE is the agency responsible for administering the permit process for activities that affect waters of the U.S. Executive Order 11990 is a Federal implementation policy, which is intended to result in no net loss of wetlands.

Clean Water Act – Section 401

Section 401 of the CWA (33 U.S.C. 1341) requires an applicant who is seeking a 404 permit to first obtain a water quality certification from the Regional Water Quality Control Board. To obtain the

water quality certification, the Regional Water Quality Control Board must indicate that the proposed fill would be consistent with the standards set forth by the State.

Department of Transportation Act - Section 4(f)

Section 4(f) has been part of Federal law since 1966. It was enacted as Section 4(f) of the Department of Transportation (DOT) Act of 1966 and set forth in Title 49 United States Code (U.S.C.), Section 1653(f). In January 1983, as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 U.S.C. Section 303. This law established policy on Lands, Wildlife and Waterfowl Refuges, and Historic Sites as follows:

> *It is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites. The Secretary of Transportation shall cooperate and consult with the Secretaries of the Interior, Housing and Urban Development, and Agriculture, and with the States, in developing transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities. The Secretary of Transportation may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of a historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if: a) There is no prudent and feasible alternative to using that land; and b) The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.*

STATE

Fish and Game Code §2050-2097 - California Endangered Species Act

The California Endangered Species Act (CESA) protects certain plant and animal species when they are of special ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the State. CESA established that it is State policy to conserve, protect, restore, and enhance endangered species and their habitats.

CESA was expanded upon the original Native Plant Protection Act and enhanced legal protection for plants. To be consistent with Federal regulations, CESA created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Under State law, plant and animal species may be formally designated by official listing by the California Fish and Game Commission.

Fish and Game Code §1900-1913 California Native Plant Protection Act

In 1977 the State Legislature passed the Native Plant Protection Act (NPPA) in recognition of rare and endangered plants of the State. The intent of the law was to preserve, protect, and enhance endangered plants. The NPPA gave the California Fish and Game Commission the power to designate native plants as endangered or rare, and to require permits for collecting, transporting, or selling such plants. The NPPA includes provisions that prohibit the taking of plants designated as "rare" from the wild, and a salvage mandate for landowners, which requires notification of the CDFW 10 days in advance of approving a building site.

Fish and Game Code §3503, 3503.5, 3800 - Predatory Birds

Under the California Fish and Game Code, all predatory birds in the order Falconiformes or Strigiformes in California, generally called “raptors,” are protected. The law indicates that it is unlawful to take, posses, or destroy the nest or eggs of any such bird unless it is in accordance with the code. Any activity that would cause a nest to be abandoned or cause a reduction or loss in a reproductive effort is considered a take. This generally includes construction activities.

Fish and Game Code §1601-1603 – Streambed Alteration

Under the California Fish and Game Code, CDFW has jurisdiction over any proposed activities that would divert or obstruct the natural flow or change the bed, channel, or bank of any lake or stream. Private landowners or project proponents must obtain a “Streambed Alteration Agreement” from CDFW prior to any alteration of a lake bed, stream channel, or their banks. Through this agreement, the CDFW may impose conditions to limit and fully mitigate impacts on fish and wildlife resources. These agreements are usually initiated through the local CDFW warden and will specify timing and construction conditions, including any mitigation necessary to protect fish and wildlife from impacts of the work.

Public Resources Code § 21000 - California Environmental Quality Act

CEQA identifies that a species that is not listed on the Federal or State endangered species list may be considered rare or endangered if the species meets certain criteria. Under CEQA public agencies must determine if a project would adversely affect a species that is not protected by FESA or CESA. Species that are not listed under FESA or CESA, but are otherwise eligible for listing (i.e., candidate or proposed) may be protected by the local government until the opportunity to list the species arises for the responsible agency.

Species that may be considered for review are included on a list of “Species of Special Concern,” developed by the CDFW. Additionally, the California Native Plant Society (CNPS) maintains a list of plant species native to California that have low numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. List 1A contains plants that are believed to be extinct. List 1B contains plants that are rare, threatened, or endangered in California and elsewhere. List 2 contains plants that are rare, threatened, or endangered in California, but more numerous elsewhere. List 3 contains plants where additional information is needed. List 4 contains plants with a limited distribution.

Public Resources Code § 21083.4 - Oak Woodlands Conservation

In 2004, the California legislature enacted SB 1334, which added oak woodland conservation regulations to the Public Resources Code. This new law requires a county to determine whether a project, within its jurisdiction, may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county must require oak woodland mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands. Such mitigation alternatives include: conservation through the use of conservation easements; planting and maintaining an appropriate number of replacement trees; contribution of funds to the Oak Woodlands Conservation Fund for the purpose of purchasing oak woodlands conservation easements; and/or other mitigation measures developed by the county.

California Oak Woodland Conservation Act

The California Legislature passed Assembly Bill 242, known as the California Oak Woodland Conservation Act, in 2001 as a result of widespread changes in land use patterns across the landscape that were fragmenting oak woodland character over extensive areas. The Act created the California Oak Woodland Conservation Program within the Wildlife Conservation Board. The legislation provides funding and incentives to ensure the future viability of California's oak woodland resources by maintaining large scale land holdings or smaller multiple holdings that are not divided into fragmented, nonfunctioning biological units. The Act acknowledged that the conservation of oak woodlands enhances the natural scenic beauty for residents and visitors, increases real property values, promotes ecological balance, provides habitat for over 300 wildlife species, moderates temperature extremes, reduces soil erosion, sustains water quality, and aids with nutrient cycling, all of which affect and improve the health, safety, and general welfare of the residents of the State.

California Wetlands Conservation Policy

In August 1993, the Governor announced the "California Wetlands Conservation Policy." The goals of the policy are to establish a framework and strategy that will:

- Ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property.
- Reduce procedural complexity in the administration of State and Federal wetland conservation programs.
- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetland conservation and restoration.

The Governor also signed Executive Order W-59-93, which incorporates the goals and objectives contained in the new policy and directs the Resources Agency to establish an Interagency Task Force to direct and coordinate administration and implementation of the policy.

LOCAL

Orange County Central-Coastal NCCP/HCP

The Orange County Central-Coastal Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) is one of the first regional HCPs developed in the country. The NCCP/HCP represents a voluntary, collaborative planning effort among a variety of partnerships having both conservation and development interests. The purpose is to provide regional protection and recovery of multiple species and habitat while allowing compatible land use and appropriate development. The NCCP/HCP was approved in 1996 and the City of Lake Forest is a signatory to the NCCP/HCP.

3.4.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on biological resources if it will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service;
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

IMPACTS AND MITIGATION

Impact 3.4-1: General Plan implementation could have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (Less than Significant)

Approval of the General Plan would not directly approve or entitle any development or infrastructure projects. However, implementation of the General Plan and Land Use Map would allow and facilitate future development in Lake Forest, which could result in adverse impacts to special-status plant and wildlife species, as well as sensitive natural habitat or wildlife movement corridors.

SPECIAL STATUS PLANT SPECIES

The search revealed documented occurrences of 46 special status plant species within the nine quad search area. Table 3.4-2 provides a list of special-status plant species that are documented within a nine quad search area (approximately a 10-mile radius) of Lake Forest, and current protective status. Figure 3.4-2 illustrates the special status species located within the nine quad search area.

Subsequent development under the proposed General Plan could result in the direct loss of habitat areas associated with these special status plant species, since suitable habitat for these species does occur in the region. Additionally, indirect impacts to special status plant species could occur with implementation of the General Plan. Indirect impacts could include habitat degradation as a result of impacts to water quality.

Special status plant species receive protection from various Federal and State laws and regulations, including FESA and CESA. These regulations generally prohibit the taking of the plant species without a special permit. Additionally, the proposed General Plan includes numerous policies and actions intended to reduce or avoid impacts to special status plant species. These policies and actions are listed below.

SPECIAL STATUS ANIMAL SPECIES

The search revealed documented occurrences of 65 special status animal species within the nine quad search area. This includes: three amphibians, 26 birds, six fish, 15 mammals, 10 reptiles, and five invertebrates. Of the 65 special status animal species within the nine quad search areas, 30 species are located within one mile of Lake Forest. Table 3.4-3 provides a list of the special-status animal species that are documented within the nine quad search area, and current protective status. Figure 3.4-2 illustrates the special status species located within the nine quad search area.

While most new development in Lake Forest that would occur under the proposed General Plan would occur in areas that have been previously developed, subsequent development under the proposed General Plan could result in the direct loss of habitat areas associated with these special status animal species, since suitable habitat for these species does occur in the region, and may occur on future development project sites within Lake Forest. Additionally, indirect impacts to special status animal species could occur with implementation of the General Plan. Indirect impacts could include habitat degradation as a result of impacts to water quality, increased human presence, and the loss of foraging habitat.

Special status animal species receive protection from various Federal and State laws and regulations, including FESA and CESA. These regulations generally prohibit the taking of a species or direct impact to foraging and breeding habitat without a special permit. Additionally, the proposed General Plan includes numerous policies and actions intended to reduce or avoid impacts to special status animal species. These policies and actions are listed below.

CONCLUSION

Construction and maintenance activities associated with future development projects under the proposed General Plan could result in the direct and indirect loss or indirect disturbance of special status plant or animal species or their habitats that are known to occur, or have potential to occur, in the region. Impacts to special status species or their habitat could result in a substantial reduction in local population size, lowered reproductive success, or habitat fragmentation. Significant impacts on special status species associated with individual subsequent projects could include:

- increased mortality caused by higher numbers of automobiles in new areas of development;
- direct mortality from the collapse of underground burrows, resulting from soil compaction;
- direct mortality resulting from the movement of equipment and vehicles through construction areas;
- direct mortality resulting from removal of trees with active nests;
- direct mortality or loss of suitable habitat resulting from the trimming or removal of obligate host plants;
- direct mortality resulting from fill of wetlands features;
- loss of breeding and foraging habitat resulting from the filling of seasonal or perennial wetlands;
- loss of breeding, foraging, and refuge habitat resulting from the permanent removal of riparian vegetation;
- loss of suitable habitat for vernal pool invertebrates resulting from the destruction or degradation of vernal pools or seasonal wetlands;
- abandoned eggs or young and subsequent nest failure for special status nesting birds, including raptors, and other non-special status migratory birds resulting from construction-related noises;

- loss or disturbance of rookeries and other colonial nests;
- loss of suitable foraging habitat for special status raptor species;
- loss of migration corridors resulting from the construction of permanent structures or features; and
- impacts to fisheries/species associated with waterways.

This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below. Subsequent development projects will be required to comply with the General Plan and adopted Federal, State, and local regulations for the protection of special status plants and animals, including habitat. The City of Lake Forest has prepared the General Plan to include numerous policies and actions intended to protect special status plants and animals, including habitat, from adverse effects associated with future development and improvement projects.

While future development has the potential to result in significant impacts to protected special status plants and animals, including habitat, the implementation of the policies and action listed below, as well as Federal and State regulations, would reduce impacts to these resources to a **less than significant** level.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-5.1: City Programs. Promote City programs that focus on habitat protection and biological conservation.

RR-5.2: Regional Coordination. Coordinate with county, state, and federal agencies and local non-profits to protect and preserve biologic resources in Lake Forest.

RR-5.3: Sensitive Communities. Protect and conserve Lake Forest's biological resources, with a special focus on sensitive, rare, or endangered plant and wildlife species in accordance with state and federal resource agency requirements.

RR-5.4: Habitat Conservation. Support habitat conservation efforts to set aside and preserve suitable habitats, with priority given to habitats for rare and endangered species in Lake Forest in accordance with state and federal resource agency requirements.

RR-5.5: Native Species. Encourage the use of native vegetation where possible.

RR-5.6: Wildlife Corridors. Participate in the planning of drainage channels, ridgelines, and other areas that provide potential wildlife linkages between open space areas in the community and the vicinity.

RR-5.7: Development. Require that all new development identify potential impacts to existing biological resources and provide mitigation measures as necessary pursuant to CEQA in order to protect these resources from negative externalities.

RR-5.8: Local Coordination. Coordinate with private and public organizations within the region to implement strategies and programs that protect and preserve biological resources within Lake Forest.

RR-5.9: Human Interaction. In areas where residents and sensitive biological resources interact, establish protective policies and/or implement design features to protect and insulate biological resources from human impacts.

RR-5.10: Urban Forest. Build upon existing streetscapes and develop an urban forest along the City's major corridors to provide avian habitat, sequester carbon monoxide emissions, foster pedestrian activity, and provide shade. The City's "urban forest" refers to all public- and privately-owned trees, vegetation, and landscaping throughout Lake Forest which provide a range of benefits to the community, including reduced energy use, cooling along streets and sidewalks, improved air and water quality, diversification of wildlife habitat, and increased health and well-being.

ACTIONS

RR-5a: Maintain a buffer area between natural (not manmade) waterways and urban development to protect water quality and riparian areas.

RR-5b: Require new development, as well as infrastructure projects, long-range planning projects, and other projects, to comply with the requirements of the Orange County Central-Coastal Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) to ensure that potentially significant impacts to special-status species and sensitive resources are adequately addressed.

Impact 3.4-2: General Plan implementation could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (Less than Significant)

The CDFW considers sensitive natural communities to have significant biotic value, with species of plants and animals unique to each community. The CNDDB search revealed 12 sensitive natural communities within the nine quad search area. The sensitive natural communities within the nine quad search area include the terrestrial communities of California Walnut Woodland, Canyon Live Oak Ravine Forest, Southern Coast Live Oak Riparian Forest, Southern Cottonwood Willow Riparian Forest, Southern Interior Cypress Forest, Southern Mixed Riparian Forest, Southern Riparian Forest, Southern Riparian Scrub, Southern Sycamore Alder Riparian Woodland, Southern Woodland Scrub, and Valley Needlegrass Grassland, and the aquatic community of Southern Coast Marsh. All 12 of these community types were once more widely distributed throughout California, but have been modified or destroyed by grazing, cultivation, and urban development. Since the remaining examples of these sensitive natural communities are under continuing threat from future development, CDFW considers them "highest inventory priorities" for future conservation. Of these 12 sensitive natural communities documented within 10 miles of Lake Forest, four are located within one mile of the Lake Forest city limits.

While not always documented as a sensitive natural community in the CNDDB, streams, rivers, wet meadows, and vernal pools are of high concern because they provide unique aquatic habitat for many endemic species, including special status plants, birds, invertebrates, and amphibians. The City of Lake Forest contains numerous aquatic habitats that qualify as sensitive habitat.

The following aquatic resources are found in the Planning Area: Aliso Creek, Serrano Creek, Borrego Canyon Wash, and San Diego Creek. Aliso Creek is a natural creek located along the west side of El Toro Road. The creek flows through open space and urban development and outlets at the ocean at Aliso Creek Beach. San Diego Creek is a main tributary within the Newport Bay Watershed, and Serrano Creek and Borrego Canyon Wash are small tributaries.

This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below. Subsequent development projects will be required to comply with the General Plan and adopted Federal, State, and local regulations for the protection of sensitive natural communities, including riparian habitat. The City of Lake Forest has prepared the General Plan to include numerous policies and actions intended to protect sensitive natural communities, including riparian habitat, from adverse effects associated with future development and improvement projects. While future development has the potential to result in significant impacts to protected habitats, the implementation of the policies and action listed below, as well as Federal and State regulations, would reduce impacts to these resources to a **less than significant** level.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-5.1: City Programs. Promote City programs that focus on habitat protection and biological conservation.

RR-5.2: Regional Coordination. Coordinate with county, state, and federal agencies and local non-profits to protect and preserve biologic resources in Lake Forest.

RR-5.3: Sensitive Communities. Protect and conserve Lake Forest's biological resources, with a special focus on sensitive, rare, or endangered plant and wildlife species in accordance with state and federal resource agency requirements.

RR-5.4: Habitat Conservation. Support habitat conservation efforts to set aside and preserve suitable habitats, with priority given to habitats for rare and endangered species in Lake Forest in accordance with state and federal resource agency requirements.

RR-5.5: Native Species. Encourage the use of native vegetation where possible.

RR-5.7: Development. Require that all new development identify potential impacts to existing biological resources and provide mitigation measures as necessary pursuant to CEQA in order to protect these resources from negative externalities.

RR-5.8: Local Coordination. Coordinate with private and public organizations within the region to implement strategies and programs that protect and preserve biological resources within Lake Forest.

RR-5.9: Human Interaction. In areas where residents and sensitive biological resources interact, establish protective policies and/or implement design features to protect and insulate biological resources from human impacts.

ACTIONS

RR-5a: Maintain a buffer area between natural (not manmade) waterways and urban development to protect water quality and riparian areas.

RR-5b: Require new development, as well as infrastructure projects, long-range planning projects, and other projects, to comply with the requirements of the Orange County Central-Coastal Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP) to ensure that potentially significant impacts to special-status species and sensitive resources are adequately addressed.

Impact 3.4-3: General Plan implementation could have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (Less than Significant)

Streams, rivers, wet meadows, and vernal pools (wetlands and jurisdictional waters) are of high concern because they provide unique aquatic habitat (perennial and ephemeral) for many endemic species, including special status plants, birds, invertebrates, and amphibians. These aquatic habitats oftentimes qualify as protected wetlands or jurisdictional waters and are protected from disturbance through the CWA.

Lake Forest contains numerous aquatic habitats that qualify as Federally protected wetlands and jurisdictional waters. As noted in Impact 3.4-2, the following aquatic resources are found in the Planning Area: Aliso Creek, Serrano Creek, Borrego Canyon Wash, and San Diego Creek. Aliso Creek is a natural creek located along the west side of El Toro Road. The creek flows through open space and urban development and outlets at the ocean at Aliso Creek Beach. San Diego Creek is a main tributary within the Newport Bay Watershed, and Serrano Creek and Borrego Canyon Wash are small tributaries.

Section 404 of the CWA requires any project that involves disturbance to a wetland or water of the U.S. to obtain a permit that authorizes the disturbance. If a wetland or jurisdictional water is determined to be present, then a permit must be obtained from the USACE to authorize a disturbance to the wetland. Although subsequent projects may disturb protected wetlands and/or jurisdictional waters, the regulatory process that is established through Section 404 of the CWA ensures that there is “no net loss” of wetlands or jurisdictional waters. If, through the design process, it is determined that a future development project cannot avoid a wetland or jurisdictional water, then the USACE would require that there be an equal amount of wetland created elsewhere to mitigate any loss of wetland.

Construction activities associated with individual future projects could result in the disturbance or loss of waters of the United States. This includes perennial and intermittent drainages; unnamed drainages; vernal pools; freshwater marshes; and other types of seasonal and perennial wetland communities. Wetlands and other waters of the United States could be affected through direct removal, filling, hydrological interruption (including dewatering), alteration of bed and bank, and other construction-related activities.

The proposed project is a planning document that does not itself approve any specific physical changes to the to the environment, adoption of the proposed project would not directly impact the environment. However, the project could have an indirect change on the physical environment through subsequently approved projects that are consistent with the buildout that is contemplated in the General Plan. The implementation of an individual project would require a detailed and site-specific review of the site to determine the presence or absence of water features. If water features are present and disturbance is required, Federal and State laws require measures to reduce, avoid, or compensate for impacts to these resources. The requirements of these Federal and State laws are implemented through the permit process.

This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below. Subsequent development projects will be required to comply with the General Plan and adopted Federal, State, and local regulations for the protection of sensitive natural communities, including protected wetlands. The City of Lake Forest has prepared the General Plan to include numerous policies and actions intended to protect wetlands and waters of the U.S. from adverse effects associated with future development and improvement projects. While future development has the potential to result in significant impacts to protected water features, the implementation of the policies and actions listed below, as well as Federal and State regulations, would reduce impacts to these resources to a **less than significant** level.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-5.6: Wildlife Corridors. Participate in the planning of drainage channels, ridgelines, and other areas that provide potential wildlife linkages between open space areas in the community and the vicinity.

RR-5.7: Development. Require that all new development identify potential impacts to existing biological resources and provide mitigation measures as necessary pursuant to CEQA in order to protect these resources from negative externalities.

PF-5.1: Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.

PF-5.8: County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

ACTIONS

RR-5a: Maintain a buffer area between natural (not manmade) waterways and urban development to protect water quality and riparian areas.

RR-5c: Require new development which has the potential to result in water quality impacts to the City's creeks and the local groundwater basin to implement all feasible mitigation measures to reduce impacts.

Impact 3.4-4: General Plan implementation would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (Less than Significant)

Habitat loss, fragmentation, and degradation resulting from land use changes or habitat conversion can alter the use and viability of wildlife movement corridors (i.e., linear habitats that naturally connect and provide passage between two or more otherwise disjunct larger habitats or habitat fragments). Wildlife habitat corridors maintain connectivity for daily movement, travel, mate-seeking, and migration; plant propagation; genetic interchange; population movement in response to environmental change or natural disaster; and recolonization of habitats subject to local extirpation or removal. The suitability of a habitat as a wildlife movement corridor is related to, among other factors, the habitat corridor's dimensions (length and width), topography, vegetation, exposure to human influence, and the species in question.

Species utilize movement corridors in several ways. "Passage species" are those species that use corridors as thru-ways between outlying habitats. The habitat requirements for passage species are generally less than those for corridor dwellers. Passage species use corridors for brief durations, such as for seasonal migrations or movement within a home range. As such, movement corridors do not necessarily have to meet any of the habitat requirements necessary for a passage species everyday survival. "Corridor dwellers" are those species that have limited dispersal capabilities – a category that includes most plants, insects, reptiles, amphibians, small mammals, and birds – and use corridors for a greater length of time.

Lake Forest contains numerous aquatic habitats that may be used for movement of wildlife. As noted in Impact 3.4-2, the following aquatic resources are found in the Planning Area: Aliso Creek, Serrano Creek, Borrego Canyon Wash, and San Diego Creek. Aliso Creek and Serrano Creek are considered wildlife migration corridors. Borrego Canyon Wash and San Diego Creek also provided opportunities for wildlife movement. Aliso Creek connects to the Whiting Ranch Wilderness Park and the general area of the Portola Hills. Although Serrano Creek is in a degraded condition, it still supports the necessary attributes needed to support animal movement, namely vegetation for cover and topography to guide animals up and downstream.

As shown in the proposed General Plan Land Use Map, Community Park/Open Space, Regional Park/Open Space, and Open Space land uses are generally found adjacent to and along both Aliso Creek and Serrano Creek. The areas designated for urban uses by the proposed Land Use Map near both creeks are generally developed with urban uses currently. The Whiting Ranch Wilderness Park is designated Regional Park/Open Space. These areas would continue to be used by wildlife as movement corridors.

Because the proposed project is a planning document and thus, no physical changes will occur to the environment, adoption of the proposed project would not directly impact the environment. There is a reasonable chance that movement corridors could be impacted throughout the buildout of subsequent individual projects. The implementation of an individual project would require a detailed and site-specific review of the site to determine the presence or absence of movement corridors on a given project site. If movement corridors are present and disturbance is required, Federal and State laws require measures to reduce, avoid, or compensate for impacts to these resources. The requirements of these Federal and State laws are implemented through the permit process.

This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below. Subsequent development projects will be required to comply with the General Plan and adopted Federal, State, and local regulations for the protection of movement corridors. The City of Lake Forest has prepared the General Plan to include three policies and one action intended to protect movement corridors from adverse effects associated with future development and improvement projects. While future development has the potential to result in significant impacts to protected movement corridors, the implementation of the policies and action listed below, as well as Federal and State regulations, would reduce impacts to these resources to a **less than significant** level.

GENERAL PLAN POLICIES AND ACTION THAT MITIGATE POTENTIAL IMPACTS

POLICIES

<u>RR-5.6: Wildlife Corridors</u>. Participate in the planning of drainage channels, ridgelines, and other areas that provide potential wildlife linkages between open space areas in the community and the vicinity.

<u>RR-5.10: Urban Forest</u>. Build upon existing streetscapes and develop an urban forest along the City's major corridors to provide avian habitat, sequester carbon monoxide emissions, foster

pedestrian activity, and provide shade. The City's "urban forest" refers to all public- and privately-owned trees, vegetation, and landscaping throughout Lake Forest which provide a range of benefits to the community, including reduced energy use, cooling along streets and sidewalks, improved air and water quality, diversification of wildlife habitat, and increased health and well-being.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.

ACTION

RR-5a: Maintain a buffer area between natural (not manmade) waterways and urban development to protect water quality and riparian areas.

Impact 3.4-5: The General Plan would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Less than Significant)

The proposed project is a policy document, in which local policies are established. This EIR presents the numerous policies of the General Plan. The General Plan itself does not conflict with its policies. Subsequent development projects will be required to comply with the General Plan policies, as well as the Municipal Code. This is a **less than significant** impact and no mitigation is required.

Impact 3.4-6: General Plan implementation would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan (Less than Significant)

As noted previously, the City of Lake Forest is a participant in the Orange County Central-Coastal NCCP/HCP. The NCCP/HCP was approved in 1996 and the City of Lake Forest is a signatory to the NCCP/HCP.

The proposed General Plan Land Use Map does not re-designate any land currently designated for open space or habitat protection. As such, the proposed General Plan and the Land Use Map are consistent with the adopted HCP/NCCP in terms of land uses and habitat protection. Implementation of the General Plan would not conflict with the provisions of an adopted HCP/NCCP, or other approved local, regional, or State habitat conservation plan.

Future projects that do not comply with the Orange County Central-Coastal NCCP/HCP could result in potentially significant impacts, which would be mitigated to a less than significant level through the implementation of Action RR-5b. Action RR-5b from the Recreation and Resources Element of the General Plan requires new development, as well as infrastructure projects, long-range planning projects, and other projects, to comply with the requirements of the NCCP/HCP to ensure that potentially significant impacts to special status species and sensitive resources are adequately

addressed. Through implementation of this Action, the General Plan would have a **less than significant** impact relative to this topic.

GENERAL PLAN ACTION THAT MITIGATES POTENTIAL IMPACTS

RR-5b: Require new development, as well as infrastructure projects, long-range planning projects, and other projects, to comply with the requirements of the Orange County Central-Coastal Natural Community Conservation Plan/Habitat Conservation Plan to ensure that potentially significant impacts to special-status species and sensitive resources are adequately addressed.

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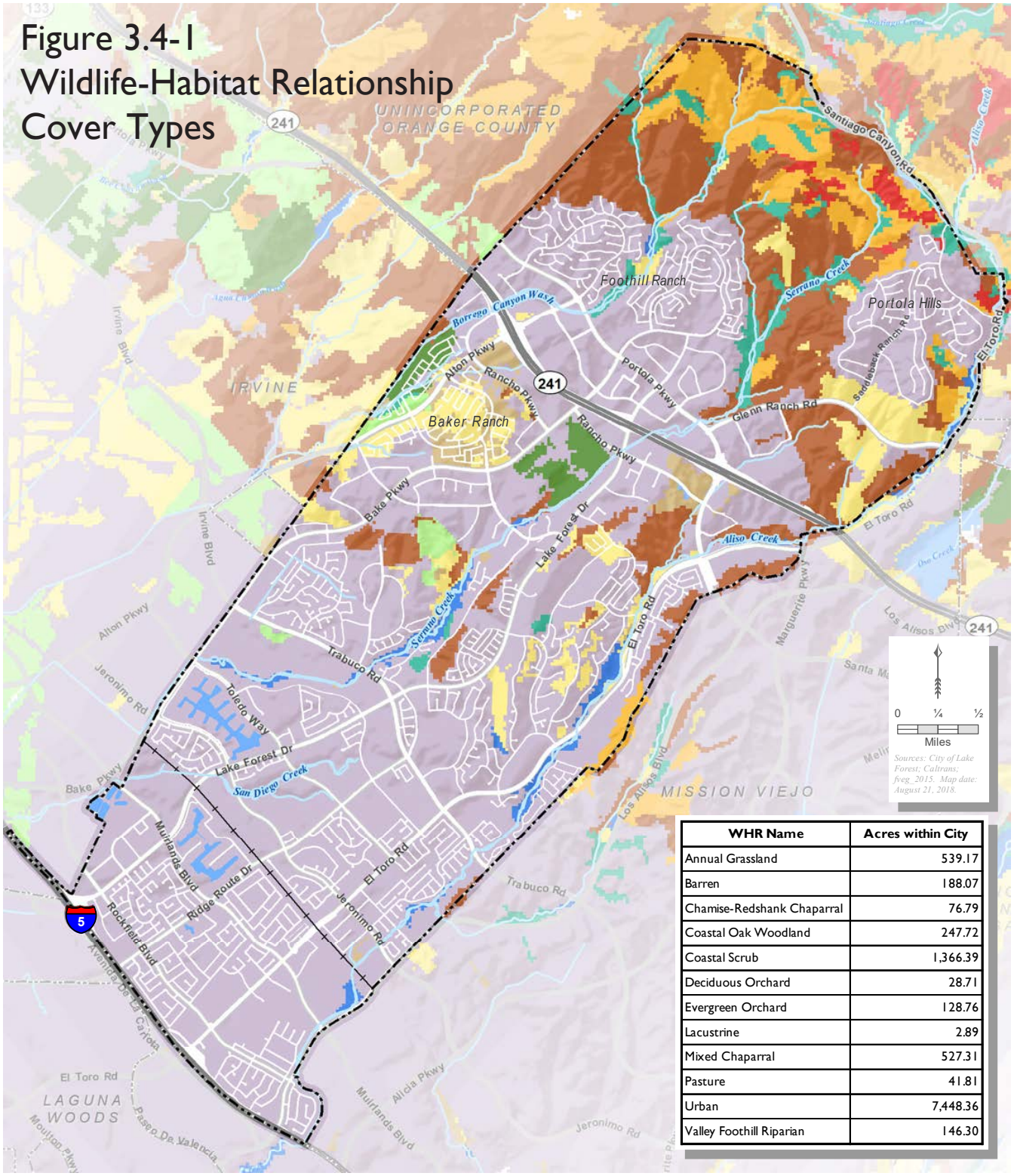
Figure 3.4-1
Wildlife-Habitat Relationship Cover Types



WHR Name	Acres within City
Annual Grassland	539.17
Barren	188.07
Chamise-Redshank Chaparral	76.79
Coastal Oak Woodland	247.72
Coastal Scrub	1,366.39
Deciduous Orchard	28.71
Evergreen Orchard	128.76
Lacustrine	2.89
Mixed Chaparral	527.31
Pasture	41.81
Urban	7,448.36
Valley Foothill Riparian	146.30

Legend

City of Lake Forest

Wildlife-Habitat Relationship (WHR) Name

- Annual Grassland
- Barren
- Chamise-Redshank Chaparral
- Coastal Oak Woodland
- Coastal Scrub
- Deciduous Orchard
- Evergreen Orchard
- Lacustrine
- Mixed Chaparral
- Pasture
- Urban
- Valley Foothill Riparian

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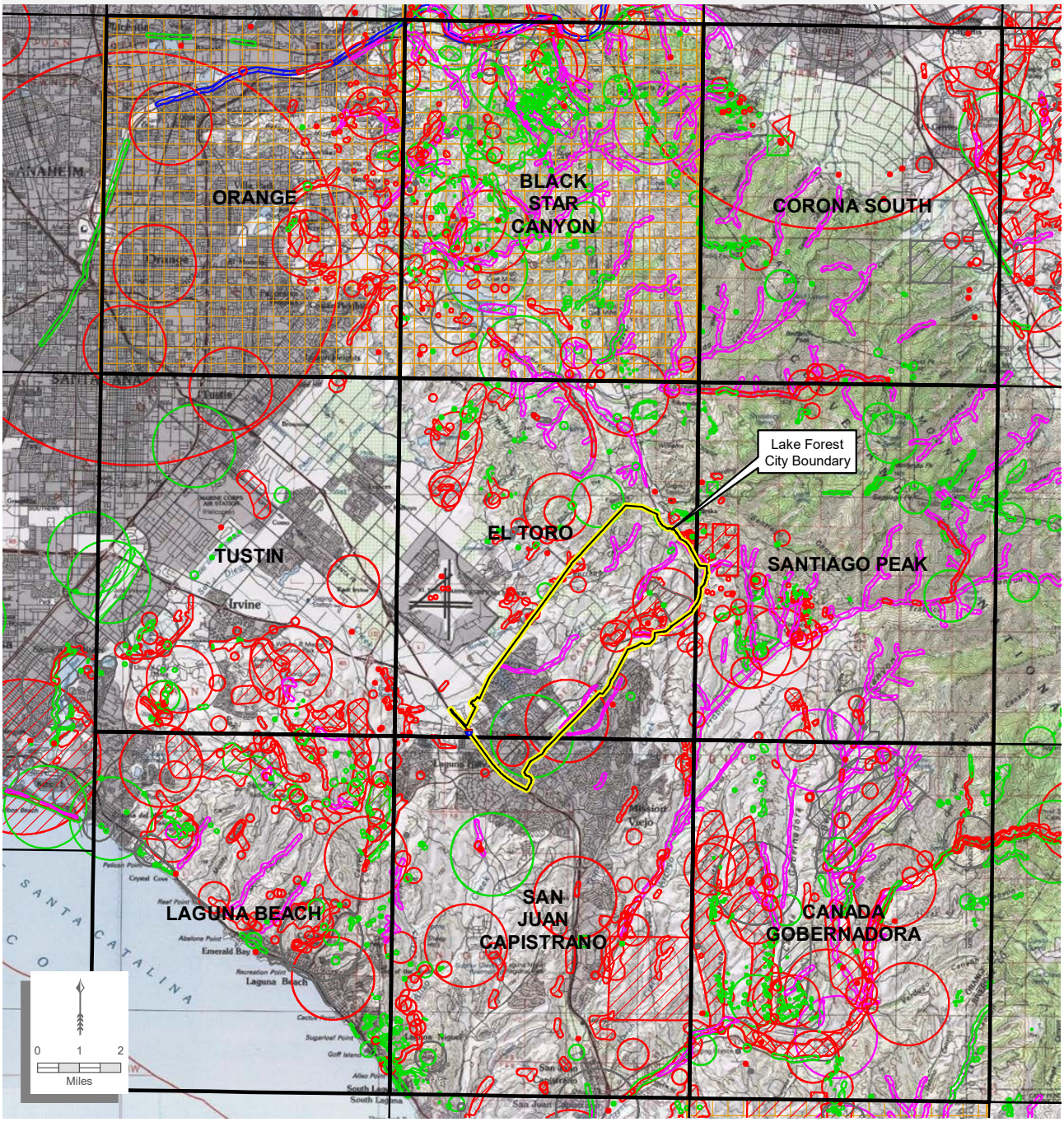
Figure 3.4-2 California Natural Diversity Database - 9-Quad Search



Special Status Species Occurrences

- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (circular)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)
- Animal (circular)
- Terrestrial Comm. (specific)
- Terrestrial Comm. (non-specific)
- Terrestrial Comm. (circular)
- Aquatic Comm. (non-specific)
- Multiple (80m)
- Multiple (specific)
- Multiple (non-specific)
- Multiple (circular)
- Sensitive EO's (Commercial only)

CNDDB version 08/2018. Please Note: the occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area. Basemap: ArcGIS Online Topographic Map Service. Map date: August 21, 2018.

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Cultural resources are defined as buildings, sites, structures, or objects that may have historical, architectural, archaeological, cultural, or scientific importance. Preservation of the city's cultural heritage should be considered when planning for the future.

This section provides a background discussion of the prehistory, ethnology, historical period background, and cultural resources found in Lake Forest. This section is organized with an existing setting, regulatory setting, and impact analysis.

The City received one comment letter related to this environmental topic during the NOP comment period. The Native American Heritage Commission (NAHC) submitted a letter, dated September 10, 2019. The comment letter provided an overview of tribal consultation requirements, and provided examples of recommended approaches to reducing potential impacts to cultural and tribal resources. The issues raised in this letter have been addressed in this chapter of the Draft EIR.

KEY TERMS

The following key terms are used throughout this section to describe cultural and tribal resources and the framework that regulates them:

Archaeology. The study of historic or prehistoric peoples and their cultures by analysis of their artifacts and monuments.

Ethnography. The study of contemporary human cultures.

Complex. A patterned grouping of similar artifact assemblages from two or more sites, presumed to represent an archaeological culture.

Midden. A deposit marking a former habitation site and containing such materials as discarded artifacts, bone and shell fragments, food refuse, charcoal, ash, rock, human remains, structural remnants, and other cultural leavings.

3.5.1 ENVIRONMENTAL SETTING

PREHISTORY

Approaches to prehistoric frameworks have changed over the years from being based on material attributes to radiocarbon chronologies to association with cultural traditions. Recently the fact that generalized terminology is suppressing the identification of cultural, spatial and temporal variation and the movement of peoples throughout space and time was noted. These factors are critical to understanding adaptation and change (Sutton and Gardner 2010:1-2).

The older Encinitas Cultural Tradition characteristics are abundant metates and manos, crudely made core and flake tools, bone tools, shell ornaments, very few projectile points with subsistence focusing on collecting (plants, shellfish, etc.). Faunal remains vary by location but include shellfish, land animals, marine mammals and fish (Sutton and Gardner 2010:7). The Encinitas Tradition pattern in

coastal Los Angeles and Orange Counties is represented by the Topanga Phase (Sutton and Gardner 2010: 8-25).

In Topanga Phase I typical characteristics were a few mortars and pestles, abundant core tools (scraper planes, choppers and hammerstones), relatively few large, leaf-shaped projectile points, cogged stones, and early discoidals (Table 3.5-1). Secondary inhumation under cairns was the common mortuary practice. In Orange County as many as 600 flexed burials were present at one site and dated 6,435 radiocarbon years before present (Sutton and Gardner 2010: 9, 13).

TABLE 3.5-1: CULTURE CHANGE CHRONOLOGY

PATTERN	*PHASE*	*DATES (BP)*	*MATERIAL TRAITS*	*OTHER TRAITS*
Encinitas	Topanga I	8,500-5,000	Abundant manos and metates, many core tools and scraper s, few but large points, charmstones, cogged stones, early discoidals, faunal remains rare	Shellfish and hunting important, secondary burials under metate cairns (some with long bones only), some extended inhumations, no cremations
	Topanga II	5,000-3,500	Abundant but decreasing manos and metates, adoption of mortars and pestles, smaller points, cogged stones, late discoidals, fewer scraper planes and core tools, some stone balls and charmstones	Shellfish important, addition of acorns, reburial of long bones only, addition of flexed inhumations (some beneath metate cairns), cremations rare
	Topanga III	3,500-1,500	Abundant but decreasing manos and metates, increasing use of mortars and pestles, wider variety of small projectile points, stone-lined ovens	Hunting and gathering important, flexed inhumations (some under rock cairns), cremations rare, possible subsistence focus on yucca/agave
Angeles/ Palomar	Angeles III & IV / San Luis Rey I	1,500-500	Appearance of bow and arrow technology, bone awls and stone/shell ornaments; changes in Olivella beads; asphaltum becomes important; reduction in obsidian use; Obsidian Butte obsidian largely replaces Coso	Small game hunting and the gathering of seeds and nuts, especially acorns important. Some small major villages, some focus on coastal resources; larger seasonal villages; flexed primary inhumations but no extended inhumations and an increase in cremations; appearance of obsidian grave goods
	Angeles V & VI / San Luis Rey II	500-150	Ceramic pipes definitely present, addition of Tizon Brown pottery and ceramic figurines, Addition of Euroamerican material culture (e.g., glass beads and metal tools), locally made pottery, metal needle-drilled Olivella beads	Primary pit cremation as the principal mortuary practice, no formal cemeteries, summer villages near water with winter villages in mountains, use of domesticated species from Euroamericans; apparent adoption of Chingichngish religion

In Topanga Phase II, flexed burials and secondary burial under cairns continued. Adoption of the mortar and pestle is a marker of this phase. Other typical artifacts include manos, mutates, scrapers, core tools, discoidals, charmstones, cogged stones and an increase in the number of projectile points. In Orange County stabilization of sea level during this time period resulted in increased use of estuary, near shore and local terrestrial food sources (Sutton and Gardner 2010:14-16).

In Topanga Phase III, there was continuing abundance of mutates, manos, and core tools plus increasing amounts of mortars and pestles. More numerous and varied types of projectile points are observed along with the introduction of stone-line earthen ovens. Cooking features such as these were possibly used to bake yucca or agave. Both flexed and extended burials are known (Sutton and Gardner 2010:17).

The younger Cultural Traditions consist of two roughly contemporaneous patterns called Angeles in Los Angeles and northern Orange Counties and Palomar in southern Orange and San Diego Counties. They are marked by a series of changes in the archaeological record, including bow and arrow, new rock art styles, settlement and subsistence systems, and perhaps ideology. The Angeles Phase appears to have been less technologically conservative and more ecologically diverse, with a largely terrestrial focus and greater emphases on hunting and nearshore fishing.

Angeles and San Luis Rey Phases demonstrate formation of major village sites along with small satellite villages. Angeles III & IV and San Luis Rey I Phases reflect a number of changes including a decrease in the use of scrapers, occasional mortars with associated manos and pestles, the appearance of bow and arrow technology, bone awls, and stone/shell ornaments. Conspicuous black midden appears also. Primary inhumation was common with primary pit cremation used more through time (Sutton 2010).

Angeles V & VI and San Luis Rey II Phases reflect important changes including appearance of Tizon Brown pottery and ceramic figurines, steatite shaft straighteners, and introduction of Euroamerican materials such as glass beads and metal knives. Other characteristics include an increase in bedrock milling features with mortars and slicks, and the appearance of cupule boulders and rock rings. Primary cremation in pits appears to have been the principal mortuary practice. Locations of cremations were not marked and there were no formal cemeteries (Sutton 2010).

ETHNOLOGY

The City is mostly located within the traditional territory of the Tongva (Gabrielino) but along the boundary of the territory of the Acjachemen (Juaneño) (McCawley 1996). Ethnographically, Aliso Creek was recorded as the boundary between the Gabrielino to the northeast and the Juaneño to the southwest (Kroeber 1976). The names Juaneño and Gabrielino were names imposed on Native Americans by Spanish missionaries to identify the indigenous peoples who occupied the surrounding areas of Mission San Juan Capistrano and Mission San Gabriel Arcángel, respectively.

Tongva

The Tongva speak a language that is part of the Takic language family. At the time of Spanish contact, their territory encompassed a vast area stretching from Topanga Canyon in the

northwest, to the base of Mount Wilson in the north, to San Bernardino in the east, Aliso Creek in the southeast and the four Southern Channel Islands, in all an area of more than 2,500 square miles (Bean and Smith 1978, McCawley 1996).

The Tongva are considered to have been one of the wealthiest tribes and to have greatly influenced tribes they traded with (Kroeber 1976:621). Houses were domed and circular structures thatched with tule or similar materials (Bean and Smith 1978:542). The best known artifacts were made of steatite and were highly prized. Many common everyday items were decorated with inlaid shell or carvings reflecting an elaborately developed artisanship (Bean and Smith 1978:542).

The main food zones utilized were marine, woodland, and grassland (Bean and Smith 1978). Plant foods were, by far, the greatest part of the traditional diet at contact. Acorns were the most important single food source. Villages were located near water sources necessary for the leaching of acorns, which was a daily occurrence. Grass seeds were the next most abundant plant food used along with chia. Seeds were parched, ground, and cooked as mush in various combinations according to taste and availability. Greens and fruits were eaten raw or cooked or sometimes dried for storage. Bulbs, roots, and tubers were dug in the spring and summer and usually eaten fresh. Mushrooms and tree fungus were prized as delicacies. Various teas were made from flowers, fruits, stems and roots for medicinal cures as well as beverages (Bean and Smith 1978:538-540).

The principal game animals were deer, rabbit, jackrabbit, woodrat, mice, ground squirrels, antelope, quail, dove, ducks and other birds. Most predators were avoided as food, as were tree squirrels and most reptiles. Trout and other fish were caught in the streams, while salmon were available when they ran in the larger creeks. Marine foods were extensively utilized. Sea mammals, fish and crustaceans were hunted and gathered from both the shoreline and the open ocean, using reed and dugout canoes. Shellfish were the most common resource, including abalone, turbans, mussels, clams, scallops, bubble shells, and others (Bean and Smith 1978:538-540).

Acjachemen

The Acjachemen (Juaneño) speak a language that is part of the Takic language family also. Their traditional tribal territory was situated partly in northern San Diego County and partly in southern Orange County. The boundaries were Las Pulgas Creek (south), Aliso Creek (north), the Pacific Ocean (west) and the Santa Ana Mountains (east). Villages were mostly along San Juan Creek, Aliso Creek, Trabuco Creek and San Mateo Creek (O'Neil and Evans 1980).

In prehistory, the Acjachemen had a patrilineal society and lived in groups with other relatives. These groups had established claims to places including the sites of their villages and resource areas. Marriages were usually arranged from outside villages establishing a social network of related peoples in the region. There was a well-developed political system including a hereditary chief. Religion was an important aspect of their society. Religious ceremonies included rites of passage at puberty and mourning rituals (Kroeber 1925:636-647).

Houses were typically conical in shape and thatched with locally available plant materials. Work areas were often shaded by rectangular brush-covered roofs (ramada). Each village had a ceremonial structure in the center enclosed by a circular fence where all religious activities were performed (Bean and Shipek 1978:553).

Women are known to have been the primary gathers of plants foods, but also gathered shellfish and trapped small game animals. Men hunted large game, most small game, fished, and assisted with plant food gathering, especially of acorns. Adults were actively involved in making tools including nets, arrows, bows, traps, food preparation items, pottery and ornaments. Tribal elders had important political and religious responsibilities and were involved in education of younger members (Bean and Shipek 1978:555).

HISTORIC PERIOD BACKGROUND

Spanish Exploration

Juan Cabrillo was the first European to sail along the coast of California in 1542 and was followed in 1602 by Sebastian Vizcaino (Bean and Rawls 1993). The Spanish colonization of what was then known as Alta California began with the 1769 overland expedition led by Gaspar de Portolá with a crew of 63 men in order to explore the land between San Diego and Monterey (Fox 1979). Between 1769 and 1822 the Spanish had colonized California and established missions, presidios, and pueblos and documented the people and landscape along the way (McCawley 1996).

Portola and his expedition crossed the area north of Lake Forest in July 1769, naming the perennial creek that empties from the Santa Ana Mountains “aliso”, the Spanish word for alder; an error on the Spanish identifier, since they were in fact, referring to the sycamore tree, which still grow along the creek. It should be noted that the Juaneño term for the creek was Seevenga, meaning “at the sycamores” (O’Neil 1988). However, historically, alder and sycamore trees were much more prominent, particularly in the riparian and floodplain areas where an oak-woodland habitat existed. During the Mission period, many of the trees along the creek, including alder, oak, sycamore, and other species were cut down for the construction of ships and structures, charcoal production, and other uses (Nasser 2003).

Following the Portolá Expedition, vast tracts of land were granted to the Missions. The seventh of the Franciscan missions in California was Mission San Juan Capistrano, founded in 1776; shortly after Portolá’s visit to the area. The goals of the missions were tri-fold: they helped establish a Spanish presence on the west coast, allowed for a means to Christianize the native peoples, and served to exploit the native population as laborers. The Spanish also hoped each mission would become a town center, whereas, “the pueblo would receive a ground of four square leagues of land… and other property would be parceled out among the Indians”. The missionaries, or padres, would essentially serve as a mayor, or head of the town (Bean 1968:29-30).

Mexican Period

In 1821 Mexico won its independence from Spain and worked to lessen the wealth and power held by the missions. The Secularization Act was passed in 1833, appropriating the vast mission lands

to the Mexican governor and downgrading the missions' status to that of parish churches. The governor then redistributed the former mission lands, in the form of land grants, to private owners (Bean and Rawls 1993; Robinson 1948). The lands were typically granted to soldiers who proved their loyalty to the Mexican government once liberated from the Spanish crown.

One these Mexican soldiers was José António Fernando Serrano who was the youngest son of Francisco Serrano, former Acalade (mayor) of the Pueblo of Los Angeles (Fox 1979). José António Fernando Serrano was granted the 10,688-acre Rancho Canada De Los Alisos, or "glen of the alders" by Governor Juan Bautista Alvarado in 1842. The grant was enlarged in 1846 by a second grant by Pio Pico in 1846 (Robinson 1948). The two combined grants that made the rancho closely mirror the shape of present day City of Lake Forest. The boundaries of the land grant were El Camino Real to the west, Aliso Creek and Rancho Trabuco to the south, Santiago Road and the Santa Ana Foothills to the east, and Rancho san Juaquin and Lomas Santiago to the north.

Rancho Canada de Los Alisos, like the other ranchos in what would become Orange County was centered on cattle husbandry and was a self-sustaining operation at its conception (Iron 1976). Cattle dominated and transformed the landscape. As the hide and tallow industry grew, and rancheros began trading their raw goods for manufactured good that came by the way of ship in the Bay (Bahía) of San Juan Capistrano, what is now present day Dana Point. Steer hides and tallow were traded for manufactured goods (hides-harnesses, shoes, saddles, door hinges, tallow-candles, horns-buttons) often made from, in many cases, from the same hide the rancheros were trading. The trade in cow hides was so ubiquitous that a steer hide, dried and folded in half (worth between one-and-a-half to two-and-a-half dollars), was referred to as a "California bank note", or a "leather dollar", or "one buck", hence the popular American slang term (Dana 1840). The area was long known as "El Toro" after the steers who roamed Canada de Los Alisos, whose loud, bellowing sounds could be heard from great distances (Iron 1976).

Serrano used the local Native American population as well as the Mestizo (Spanish and Native) population to build, plant, plow, and tend to the livestock of the rancho, resembling the feudal system (Osterman 1992). In addition to cattle, Serrano bred Mustangs and sheep, he also grew grain, corn, watermelons, and grapes. José Serrano acted as the Juez de Campo, or judge of the fields, an official role that was tasked with settling disputes between rancheros over livestock ownership as well as presiding over (Iron 1976).

American Period

Following the cession of California to the United States after the Mexican-American War, a claim for the Rancho was filed with the Public Land Commission in 1852 as required by the Land Act of 1851, and the grant was eventually patented to Serrano in 1871 after much litigation (Carpenter 2003).

After the cession of California to the United States, a stagecoach route passed through the El Toro as early as the late 1850s and a stagecoach stop was established just south of El Toro (Fox 1979). Stagecoaches primarily carried mail, but carried passengers as well. The El Toro stop became a popular holdover for passengers traveling to the coast via Laguna Canyon.

A series of droughts affected the area from 1863 until 1883 causing the death of Serrano's herds as well as the herds of the surrounding ranchos (Fox 1979). Serrano borrowed money at outrageous interest rates, using his land as collateral. Serrano eventually went bankrupt and was forced to mortgage and ultimately foreclose the ranch to J.S. Slauson, a Los Angeles banker. Losing control of the Rancho Canada de Los Alisos, Serrano and his family were evicted from their land (Iron 1976). Serrano purchased U.S. government claims just north of their former rancho near Cooks Corner at the intersection of El Toro, Santiago Canyon, and Live Oak Canyon where some of his descendants still live (Osterman 1992).

Slauson subdivided the land into ten parcels and leased a portion of the rancho lands to Juan Gless and his sons who raised sheep during the drought. When the drought subsided, more families settled into the Saddleback Valley. Settlers raised cattle and sheep, planted vineyards and fruit trees. By 1886 the majority of the Saddleback Valley was planted in grapes, until plant disease called the "Anaheim Disease" decimated the vineyards. Orange and walnuts trees soon replaced the failed vineyards (Iron 1976).

By the time Bostonian Dwight Whiting purchased 10,000 acres of the former Rancho de Los Alisos in 1884, the area was already a stagecoach stop that connected San Diego and Los Angeles, with later diversions to Santa Ana and Laguna Beach. Whiting intended to establish a new town inhabited by English gentlemen farmers. Whiting was able bring the San Bernardino and San Diego Railway Co. through his land in 1887, thus founding the town of Aliso City (Iron 1976). The railroad "boom" brought an influx of people into southern California and numerous cities were proposed. On paper, many of these cities were absorbed by larger ones, while most, like Aliso City, remained small towns (Osterman 1992).

The young Aliso City was laid out just north of the railroad tracks, and some of those original streets remain on the map today. Front, Second, and Third Streets run parallel to the railroad tracks, while Orange, Olive, and Cherry Street run parallel to El Toro Road. At the time, El Toro Road was originally Los Alisos Avenue and present day Los Alisos Boulevard was formally Lemon Avenue (Osterman 1992). The "boom" never attracted the hordes of people to Aliso City that its founders had hoped for and the name Aliso City was too similar to a nearby place, so the local residents of the area held a meeting in a freight room of the railroad depot and voted to permanently rename their small town to El Toro (Osterman 1992).

Determined to attract "gentlemen farmers" of English heritage, Whiting used his vast land holding to experiment on a number of agricultural ventures to attract the second and third born English sons who could not inherit land, but could use their family's wealth to sponsor careers in farming (Osterman 1992). Whiting experimented with multiple crops including fruit trees like apricots, peaches, plums, prunes, and olives; all with little success. Another unsuccessful, but lasting contribution to the area was Whiting's investment in the Eucalyptus craze that struck the lumber starved southern California. Whiting established a 400 acre of dense Eucalyptus tree forest located between present day Ridge Route, Jeronimo, Lake Forest and Serrano Roads. However, when it was discovered that the grain twisted and cracked as it dried, rendering it worthless for construction and furnishings the hopeful cash crop busted. While the failed project was later

referred to as "Whiting's Folly", the Eucalyptus is now a ubiquitous characteristic of the present day Lake Forest, the city's name originating from Whiting's man-made forest (Iron 1976).

In the 1890s, the Saddleback Valley was dry farmed by tenant farming, in which farmers did not own their land, but rented it from their landlords, also known as sharecropping (Osterman 1992). Dry farming crops included barley (the major grain crop), and hay for the livestock. Black-eyed beans were also dry farmed and, while more difficult to farm, turned a higher profit (Osterman 1992). It wasn't until the 1920s that citrus came to the Saddleback Valley. Charles Bennet, an early pioneer attracted to the former Aliso City, pioneered the citrus industry in El Toro by drilling deeper wells (Osterman 1992). Despite the success in citrus in El Toro, the City remained small, serving as the Saddleback Valley's shipping and social center (Osterman 1992).

Modern Period

In 1942, El Toro Marine Corps Air Station was established and was designated as a Master Jet Station. After World War II all United States Presidents landed in Air Force One at this base. After World War II the agricultural land was developed into residential, commercial, and industrial areas. In 1999 the Marine Corps Air Station El Toro was decommissioned.

In 1958, Whiting sold the Rancho to V.P. Baker and Associates. In 1969, the Bakers sold the property to the Deane Bros. who later incorporated into the Occidental Petroleum, Land Development Division. They started the residential development of the area, executing a master planned community that eventually became the City of Lake Forest Planned Community. During the 1960s, a steady supply of water brought in by aqueducts from Northern California, as well as from the Colorado River, facilitated the transformation of the Saddleback Valley from an agricultural community to the multi-city, suburban region it is known as today (Osterman 1992). The City of Lake Forest was incorporated in 1991 and is named for the two man-made lakes within the city as well as the man-made Eucalyptus forest.

CULTURAL RESOURCES IN THE LAKE FOREST PLANNING AREA

California Historic Resources Inventory System

A search of the California Historic Resources Inventory System (CHRIS) at the South Central Coastal Information Center (SCCIC) located on the campus of California State University, Fullerton (CSUF) was conducted on March 28, 2018 by Cogstone archaeologist Megan Wilson. The records search covered the entire 10,748.50 acres of the City of Lake Forest (the Planning Area) and covered portions of the El Toro, San Juan Capistrano, and Santiago Peak USGS 7.5 topographic maps. Results of the record search indicate that 167 previous cultural resources studies have been completed within the boundaries of the City of Lake Forest.

The records search determined that 138 previously recorded cultural resources are located within the City boundaries (Table 3.5-2). Of these 138 resources, one resource includes a portion of the Upper Aliso Creek Archaeological District, 87 prehistoric archaeological sites, 36 prehistoric archaeological isolates, five multicomponent sites, one historic archaeological site, two historic

isolates, six historic resources, one historic district listed (Heritage Hill Historical Park) on the NRHP and CHL.

Site P- 30-156547 consists of a historic district, the Heritage Hill Historical Park located at 25151 Serrano Road, Lake Forest CA 92630-2534. This site is registered on the National Register of Historic Places (NR No. 7600050), California Historical Landmark (No. 199), and is registered as an Orange County Historical Landmark. The Site consists of the original location of the Serrano Adobe (1868) as well as the relocated Bennet Ranch House (1908), the El Toro Grammar School (1890), and the St. George's Episcopal Mission (1891). Table 3.5-2 lists all of the previously recorded cultural resources within the Lake Forest Planning Area.

TABLE 3.5-2: PREVIOUSLY RECORDED CULTURAL RESOURCES WITHIN THE CITY OF LAKE FOREST

PRIMARY NO.	*OTHER IDENTIFIER*	*SITE TYPE*	*SITE DESCRIPTION*	*YEAR RECORDED*	*MAPS*
P-30-000016	CA-ORA-000016	Prehistoric Archaeological Site	Lithic scatter	1949	San Juan Capistrano
P-30-000037	CA-ORA-000037	Prehistoric Archaeological Site	Unidentified	1949	El Toro
P-30-000038	CA-ORA-000038	Multicomponent Site	Multicomponent	1949	El Toro
P-30-000039	CA-ORA-000039	Prehistoric Archaeological Site	Lithic scatter	1949, 1976, 1978	El Toro
P-30-000040	CA-ORA-000040	Prehistoric Archaeological Site	Lithic scatter	1949	El Toro
P-30-000042	CA-ORA-000042	Prehistoric Archaeological Site	Lithic scatter	1949, 1980	El Toro
P-30-000176	CA-ORA-000176	Prehistoric Archaeological Site	Lithic scatter	1966, 1991	El Toro
P-30-000438	CA-ORA-000438	Prehistoric Archaeological Site	Lithic scatter	1973, 1995, 1997, 2001	El Toro
P-30-000439	CA-ORA-000439	Prehistoric Archaeological Site	Lithic scatter	1973, 2001	El Toro, Santiago Peak
P-30-000440	CA-ORA-000440	Prehistoric Archaeological Site	Lithic scatter	1973, 2001	El Toro
P-30-000441	CA-ORA-000441	Prehistoric Archaeological Site	Lithic scatter, cairn	1973, 2001, 2007, 2014	El Toro
P-30-000442	CA-ORA-000442	Prehistoric Archaeological Site	Lithic scatter	1973, 2007	El Toro
P-30-000443	CA-ORA-000443	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000444	CA-ORA-000444	Prehistoric Archaeological Site	Lithic scatter	1974, 1994, 20017	El Toro
P-30-000445	CA-ORA-000445	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000446	CA-ORA-000446	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000447	CA-ORA-000447	Prehistoric Archaeological Site	Lithic scatter	1973, 1978, 2007	El Toro
P-30-000448	CA-ORA-000448/H	Multicomponent Site	Lithic scatter, foundations	1974, 2001	El Toro
P-30-000449	CA-ORA-000449	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro, Santiago Peak
P-30-000450	CA-ORA-450	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro, Santiago Peak
P-30-000451	CA-ORA-000451	Prehistoric Archaeological Site	Lithic scatter	1973, 1982	Santiago Peak
P-30-000452	CA-ORA-000452	Prehistoric Archaeological Site	Lithic scatter, projectile points	1974, 2001	El Toro

PRIMARY NO.	OTHER IDENTIFIER	SITE TYPE	SITE DESCRIPTION	YEAR RECORDED	MAPS
P-30-000453	CA-ORA-000453	Multicomponent Site	Rockshelter, lithic scatter, historic carving "1887/4"	1974, 2001	El Toro
P-30-000454	CA-ORA-000454	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro
P-30-000455	CA-ORA-000455	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro
P-30-000456	CA-ORA-000456	Prehistoric Archaeological Site	Lithic scatter	1974, 1978, 2001	El Toro
P-30-000460	CA-ORA-000460	Prehistoric Archaeological Site	Lithic scatter	1974	El Toro
P-30-000489	CA-ORA-000489	Prehistoric Archaeological Site	Lithic scatter	1973, 1980, 2004	El Toro
P-30-000490	CA-ORA-000490	Prehistoric Archaeological Site	Lithic scatter	1973, 1982	El Toro
P-30-000491	CA-ORA-000491	Prehistoric Archaeological Site	Lithic scatter	1973, 1980, 1980	El Toro
P-30-000510	CA-ORA-000510	Prehistoric Archaeological Site	Lithic scatter	1975, 1994	El Toro
P-30-000514	CA-ORA-000514	Prehistoric Archaeological Site	Habitation site, discoidal	1976, 1977	El Toro
P-30-000536	CA-ORA-000536	Prehistoric Archaeological Site	Lithic scatter	1976	El Toro
P-30-000544	CA-ORA-000544	Prehistoric Archaeological Site	Lithic scatter	1976, 1977	El Toro
P-30-000566	CA-ORA-000566	Prehistoric Archaeological Site	Lithic scatter	1973, 1977	El Toro
P-30-000579	CA-ORA-000579	Prehistoric Archaeological Site	Shell scatter	1975	San Juan Capistrano
P-30-000594	CA-ORA-000594	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro
P-30-000602	CA-ORA-000602	Prehistoric Archaeological Site	Lithic scatter	1976, 2002	El Toro
P-30-000612	CA-ORA-000612/H	Multicomponent Site	Lithic scatter, habitation debris, and historic refuse scatter. Serrano-Whiting Adobe Site	1977	El Toro
P-30-000628	CA-ORA-000628	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro
P-30-000647	CA-ORA-000647	Prehistoric Archaeological Site	Quarry site, lithic tools and scatter	1977, 1986, 1994	El Toro
P-30-000648	CA-ORA-000648	Prehistoric Archaeological Site	Temporary habitation area	1977, 1994	El Toro
P-30-000693	CA-ORA-693	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	
P-30-000694	CA-ORA-000694	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	El Toro
P-30-000695	CA-ORA-000695	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	El Toro
P-30-000696	CA-ORA-000696	Prehistoric Archaeological Site	Habitation area, lithic scatter	1977, 1978	El Toro
P-30-000697	CA-ORA-000697	Prehistoric Archaeological Site	Lithic scatter	1977, 1978	El Toro
P-30-000698	CA-ORA-000698	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro
P-30-000699	CA-ORA-000699	Prehistoric Archaeological Site	Lithic scatter	1977, 1978	El Toro
P-30-000739	CA-ORA-000739	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000742	CA-ORA-000742	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000743	CA-ORA-000743	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000741	CA-ORA-000741	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000756	CA-ORA-000756	Prehistoric Archaeological Site	Lithic scatter	1978, 1996	El Toro
P-30-000773	CA-ORA-000773	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000825	CA-ORA-000825	Prehistoric Archaeological Site	Lithic scatter	1979, 1997, 2014	El Toro
P-30-000826	CA-ORA-000826	Prehistoric Archaeological Site	Lithic scatter	1979, 1982, 1997	El Toro
P-30-000827	CA-ORA-000827	Prehistoric Archaeological Site	Lithic scatter	1979, 1995	El Toro
P-30-000828	CA-ORA-000828	Prehistoric Archaeological Site	Lithic scatter	1979, 1980	El Toro

PRIMARY NO.	OTHER IDENTIFIER	SITE TYPE	SITE DESCRIPTION	YEAR RECORDED	MAPS
P-30-000905	CA-ORA-000905	Prehistoric Archaeological Site	Lithic scatter	1980, 1982	El Toro
P-30-000949	CA-ORA-000949	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000950	CA-ORA-000950	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000951	CA-ORA-000951	Prehistoric Archaeological Site	Rockshelter, habitation area, midden, lithic scatter, hearth	1980	El Toro
P-30-000952	CA-ORA-000952	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000953	CA-ORA-000953	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000954	CA-ORA-000954	Prehistoric Archaeological Site	Lithic scatter, shell scatter	1980	El Toro
P-30-000955	CA-ORA-000955	Prehistoric Archaeological Site	Bedrock milling features	1980	El Toro
P-30-000957	CA-ORA-000957	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000958	CA-ORA-000958	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000959	CA-ORA-000959	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000960	CA-ORA-000960	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-001004	CA-ORA-001004	Prehistoric Archaeological Site	Lithic scatter	1981	El Toro
P-30-001057	CA-ORA-001057	Prehistoric Archaeological Site	Rock cairn, lithic scatter	1984	El Toro
P-30-001058	CA-ORA-001058	Prehistoric Archaeological Site	Rock cairn, lithic scatter	1984	El Toro
P-30-001063	CA-ORA-001063	Prehistoric Archaeological Site	Projectile point, lithic scatter	1984, 1994	El Toro
P-30-001064	CA-ORA-001064	Prehistoric Archaeological Site	Lithic scatter, hearth	1984, 1994	El Toro
P-30-001066	CA-ORA-001066	Prehistoric Archaeological Site	Lithic scatter, hearth	1984, 1994	El Toro
P-30-001097	CA-ORA-001097/H	Multicomponent Site	Lithic scatter, ruins of the Henry Serrano Adobe, and historic refuse deposit	1985	Santiago Peak
P-30-001100	CA-ORA-001100	Prehistoric Archaeological Site	Lithic scatter	1985, 1991	El Toro
P-30-001145	CA-ORA-001145	Prehistoric Archaeological Site	Lithic scatter	1988	El Toro
P-30-001146	CA-ORA-001146	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001147	CA-ORA-001147	Prehistoric Archaeological Site	Quarry, lithic scatter	1988	El Toro
P-30-001148	CA-ORA-001148	Prehistoric Archaeological Site	Lithic scatter	1988	El Toro
P-30-001149	CA-ORA-001149	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001150	CA-ORA-001150	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001171	CA-ORA-001171	Prehistoric Archaeological Site	Lithic scatter	1988, 1994	El Toro
P-30-001242	CA-ORA-001242	Prehistoric Archaeological Site	Lithic scatter	1990	El Toro
P-30-001345	CA-ORA-001345	Prehistoric Archaeological Site	23 hearths	1992	El Toro
P-30-001362	CA-ORA-001362	Prehistoric Archaeological Site	Lithic scatter	1994	El Toro
P-30-001373	CA-ORA-001373	Prehistoric Archaeological Site	Lithic scatter	1994	El Toro
P-30-001430	CA-ORA-001430	Prehistoric Archaeological Site	Lithic scatter	1995	El Toro
P-30-001496	N/A	Historic Resource	Concrete and metal troughs, holding pen	1980	El Toro
P-30-001497	N/A	Historic Resource	Water tower	1980	El Toro
P-30-001498	N/A	Historic Resource	Metal shed	1998	El Toro
P-30-001500	CA-ORA-001500H	Historic Resource	Wood water tank	1998	El Toro

PRIMARY NO.	OTHER IDENTIFIER	SITE TYPE	SITE DESCRIPTION	YEAR RECORDED	MAPS
P-30-001501	CA-ORA-001501H	Historic Archaeological Site	Collapsed shed and structural debris	1998	El Toro
P-30-001728	N/A	Archaeological District	Upper Aliso Creek Archaeological District	1978, 2001	El Toro, Santiago Peak
P-30-001741	CA-ORA-001741	Prehistoric Archaeological Site	Lithic scatter	1986	El Toro
P-30-100186	N/A	Prehistoric Isolate	Utilized chert flake	1977	El Toro
P-30-100187	N/A	Prehistoric Isolate	Scraper-core fragment and flake	1977	El Toro
P-30-100188	N/A	Prehistoric Isolate	Cobble and debitage	1977	El Toro
P-30-100219	N/A	Prehistoric Isolate	Granitic mano	2014	El Toro
P-30-100220	N/A	Prehistoric Isolate	Chert flake	2014	El Toro
P-30-100276	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100278	N/A	Prehistoric Isolate	Hammerstone	1980	El Toro
P-30-100279	N/A	Prehistoric Isolate	Mano	1980	El Toro
P-30-100280	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100281	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100282	N/A	Prehistoric Isolate	Mano	1980	El Toro
P-30-100283	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100285	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100288	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100289	N/A	Prehistoric Isolate	Metate	1980	El Toro
P-30-100290	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100294	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100295	N/A	Prehistoric Isolate	Core	1980	El Toro
P-30-100296	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100305	N/A	Prehistoric Isolate	Utilized flake	1980	El Toro
P-30-100309	N/A	Historic Isolate	Concrete foundation/slab	1984	El Toro
P-30-100310	N/A	Prehistoric Isolate	Chert flake	1998	El Toro
P-30-100311	N/A	Prehistoric Isolate	Chopper/scraper	1984	El Toro
P-30-100312	N/A	Historic Isolate	Concrete trough	1980	El Toro
P-30-100313	N/A	Prehistoric Isolate	Quartzite core	1993	El Toro
P-30-100371	N/A	Prehistoric Isolate	Abalone shell fragment	2006	El Toro
P-30-100438	N/A	Prehistoric Isolate	Chert scraper	1984	El Toro
P-30-100439	N/A	Prehistoric Isolate	Mano fragment	1984	El Toro
P-30-100444	N/A	Prehistoric Isolate	Quartzite chopper	1989	El Toro
P-30-100445	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100446	N/A	Prehistoric Isolate	Metate fragment	1991	El Toro
P-30-100447	N/A	Prehistoric Isolate	Core	1991	El Toro
P-30-100448	N/A	Prehistoric Isolate	Mortar and core	1991	El Toro
P-30-100449	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100453	N/A	Prehistoric Isolate	Flake	1994	El Toro
P-30-100463	N/A	Prehistoric Isolate	2 utilized chert flakes	1991	El Toro
P-30-100464	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100491	N/A	Prehistoric Isolate	Mano fragment	2011	El Toro
P-30-156547	NR. No 76000505,	Historic Resource	Heritage Hill Historic	1935, 1959, 1976,	El Toro

PRIMARY NO.	OTHER IDENTIFIER	SITE TYPE	SITE DESCRIPTION	YEAR RECORDED	MAPS
	CHL No. 199, HRI No. 035907, OC Historical Landmark		Site; Serrano Adobe, :1856-1860, Bennet House (1908), El Toro School (1890), St. George's Church (1891).	1980	
P-30-176663	N/A	Historic Resource	Railroad, Aitchison-Topeka-Santa Fe	2002, 2002, 2007, 2012, 2016	El Toro, San Juan Capistrano

Other Sources

In addition to the SCCIC records search, a variety of other sources were consulted in February and May 2018 to obtain information regarding the cultural context of the City of Lake Forest (Table 3.5-3). Sources included the National Register of Historic Places (NRHP) and the California Register of Historic Resources (CRHR) which includes the California Historical Resources Inventory (CHRI), California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI). The Bureau of Land Management (BLM) General Land Office records were also searched (Table 3.5-4).

TABLE 3.5-3: ADDITIONAL SOURCES CONSULTED

SOURCE	RESULTS
National Register of Historic Places (NRHP/NR; 1979-2002 & supplements)	Positive: one listing, the Serrano Adobe, NR. 76000505
Historic USGS Topographic (Topo) Maps	Positive: The earliest USGS Topo map for the area is the 1901 30' Southern California Sheet no. 1 that shows the Canada de Ls Alisos Rancho the then Southern California Railroad, El Toro Road (then Los Alisos Avenue), El Camino Real, as well as the town of El Toro and the old stagecoach stop can be inferred from this Topo map. No new information can be gleaned from following Topo maps until the 1942 Santiago Peak 7.5' Topo map that shows El Toro Road (still Los Alisos Avenue at that time) as a secondary highway and shows Highway 101 as a primary highway. More development is present at old El Toro's historic downtown core. The area around Aliso Creek is symbolized as agricultural enterprises and likely included citrus orchards. The 1968 El Toro and San Juan Capistrano 7.5' Topo maps show the completed of Interstate 5 at the former location of Highway 101 and the beginning of small housing tracts near the old El Toro downtown area.
Historic US Department of Agriculture Aerial Photographs	The earliest historical aerial for the City dates to 1938 and shows numerous agricultural fields surrounding El Toro Road, then Los Alisos Avenue. Development is concentrated with old El Toro's Historic downtown core and near the area of the Serrano Adobe/Heritage Hill Area. A conspicuous feature on the landscape is Whiting experimental Eucalyptus forest, which can be seen spanning the area north of the railroad to Jeronimo Road, centered along Ridge Route. The landscape dramatically changes in the 1967 aerial with the replacement of Highway 101 with Interstate 5 and the aggressive commercial and residential development south of Jeronimo Road and north of Interstate 5. Development creeps northwest in later years.
California Historical Resources	Positive: one listing, the Serrano Adobe HRI No. 035907

SOURCE	*RESULTS*
Inventory (CHRI/HRI; 1976-2014)	
California Historical Landmarks (CHL; 1995 & supplements to 2014)	Positive: one listing, the Serrano Adobe, CHL 199
California Points of Historical Interest (CPHI; 1992 to 2014)	Negative
Orange County Historical Sites	Positive: one listing, Heritage Hill Historical Park
Mills Act Property Contract Program	Negative
Historic Bridges	Positive: 55C0212, Ridge Route Drive, Union Pacific:1967
Bureau of Land Management (BLM) General Land Office Records (GLO)	Positive: See Table 6
Local Historical Society, Saddleback Valley Historical Society (SVHS)	Positive: 3572 Prothero, Lake Forest. "Prothero House": 1920 23512 El Toro Rd, Lake Forest, CA 92630, Big Shots Pool Hall and El Toro Meat Market, original location of the El Toro General Store (1890s).

TABLE 3.5-4: BLM GENERAL LAND OFFICE RECORDS

USGS 7.5 TOPOGRAPHIC QUAD(S)	*TOWNSHIP*	*RANGE*	*SECTION(S)*	*YEAR, NAME*
El Toro	5S	7W	29,	1866, Southern Pacific Railroad; 1871, Jose Serrano; 1878, Samuel Shrewsbury
			30, 31,	1871, Jose Serrano;
			32	18591, Joaquin Serrano
		8W	36	1871, Jose Serrano
	6S	7W	07, 08, 18	1866, Juan Forster
		8W	01	1871, Jose Serrano; 1868 Theodocio Yorba
			13, 23, 24	1866, Juan Forster; 1871, Jose Serrano
			22	1867 Jose Sepulveda; 1871 Jose Serrano
			01, 02, 10, 11, 12, 14, 15, 16, 21	1871, Jose Serrano
El Toro and San Juan Capistrano	6W	8W	26	1866 Juan Forster; 1871, Jose Serrano; 1875 & 1666, George Y. Barry; 1892 Charles M. Salter
			27	1871, Jose Serrano
			28	1871, Jose Serrano; 1877, 1882, State of California;
San Juan Capistrano	6W	8W	34	1871, Jose Serrano; 1883 Hiram H. & Cyrus Rawson, J.E. Bacon
			35	1871 Jose Serrano

NATIVE AMERICAN CONSULTATION

A Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on March 23, 2018. The NAHC replied the same day and indicated that a search of the SFL was completed with positive results in the Santiago Peak USGS Quadrangle and that the Juaneño Band of Mission Indians should be contacted for more information about the site.

The City of Lake Forest conducted Native American consultations under Senate Bill 18 (Chapter 905, Statutes of 2004), also known as SB18, which requires local governments to consult with Tribes prior to making certain planning decisions and requires consultation and notice for a general and specific plan adoption or amendments in order to preserve, or mitigate impacts to, cultural places that may be affected. In addition to SB18 consultation, the City conducted tribal consultations under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)), also known as AB 52, which requires consulting for projects within the City of Lake Forest's jurisdiction and within the traditional territory of the Tribal Organizations who have previously requested AB52 consultations with the City. Four Tribal Organizations were contacted under AB52 and 11 were contacted under SB18.

The City of Lake Forest sent letters to all 15 Tribal Organizations on June 4, 2018 via certified mail. Follow-up emails were sent on June 26, 2018, and follow up phone calls were made on July 18, 2018; however, additional contact attempts were made to the Juaneño Band of Mission Indians Acjachemen Nation. To date, four responses have been received and are summarized below.

- On August 31, 2018 Ms. Joyce Perry of the Juaneño Band of Mission Indians Acjachemen Nation, via phone conversation, requested that the City of Lake Forest notify the Tribe regarding any development projects located within the City limits. She informed that the Santa Ana foothills and area around the Aliso Creek watershed are extremely sensitive for tribal cultural resources including ancestor remains.
- On August 31, 2018, Mr. Marcos Guerrero indicated that he believed the UAIC was placed on the City of Forest /Orange County list by accident.
- On June 12, 2018 Mr. Ray Teran indicated that Viejas Tribe has determined that the project has little cultural significance to the Viejas Tribe. He recommended that local Tribes be consulted.
- On July 18, 2018 the receptionist of the Jamul Indian Village indicated that the City of Lake Forest is off their reservation and outside of their traditional tribal territory and defers to local Tribes.

3.5.2 REGULATORY SETTING

FEDERAL REGULATIONS

National Historic Preservation Act

Most regulations at the Federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for Federal land-holding agencies, but also includes regulations (Section 106) which pertain to all projects that are funded, permitted, or approved by any Federal agency and which have the potential to affect cultural resources. All projects that are subject to NEPA are also subject to compliance with Section 106 of the NHPA and NEPA requirements concerning cultural resources. Provisions of NHPA establish a National Register of Historic Places (The National Register) maintained by the National Park Service, the Advisory Councils on Historic Preservation, State Historic Preservation Offices, and grants-in-aid programs.

American Indian Religious Freedom Act and Native American Graves and Repatriation Act

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It establishes as national policy that traditional practices and beliefs, sites (including right of access), and the use of sacred objects shall be protected and preserved. Additionally, Native American remains are protected by the Native American Graves and Repatriation Act of 1990.

Other Federal Legislation

Historic preservation legislation was initiated by the Antiquities Act of 1966, which aimed to protect important historic and archaeological sites. It established a system of permits for conducting archaeological studies on federal land, as well as setting penalties for noncompliance. This permit process controls the disturbance of archaeological sites on federal land. New permits are currently issued under the Archaeological Resources Protection Act (ARPA) of 1979. The purpose of ARPA is to enhance preservation and protection of archaeological resources on public and Native American lands. The Historic Sites Act of 1935 declared that it is national policy to "Preserve for public use historic sites, buildings, and objects of national significance."

STATE REGULATIONS

California Register of Historic Resources (CRHR)

California State law also provides for the protection of cultural resources by requiring evaluations of the significance of prehistoric and historic resources identified in documents prepared pursuant to the California Environmental Quality Act (CEQA). Under CEQA, a cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines. Criteria identified in the CEQA Guidelines are similar to those described under the NHPA. The State Historic Preservation Office (SHPO) maintains the CRHR. Historic properties listed, or formally designated for eligibility to be listed, on The National Register are automatically listed on the CRHR. State Landmarks and Points of Interest are also automatically listed. The CRHR can also include properties designated under local preservation ordinances or identified through local historical resource surveys.

California Environmental Quality Act (CEQA)

CEQA requires that lead agencies determine whether projects may have a significant effect on archaeological and historical resources. This determination applies to those resources which meet significance criteria qualifying them as "unique," "important," listed on the California Register of Historical Resources (CRHR), or eligible for listing on the CRHR. If the agency determines that a project may have a significant effect on a significant resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA emphasizes avoidance of archaeological and historical resources as the preferred means of reducing potential significant environmental effects resulting from projects. If avoidance is not feasible, an excavation program or some other form of mitigation must be developed to mitigate the impacts. In order to adequately address the level of potential impacts, and thereby design appropriate mitigation measures, the significance and nature of the cultural resources must be determined. The following are steps typically taken to assess and mitigate potential impacts to cultural resources for the purposes of CEQA:

- identify cultural resources;
- evaluate the significance of the cultural resources found;
- evaluate the effects of the project on cultural resources; and
- develop and implement measures to mitigate the effects of the project on cultural resources that would be significantly affected.

In 2015, CEQA was amended to require lead agencies to determine whether projects may have a significant effect on tribal cultural resources. (Public Resources Code [PRC] § 21084.2). To qualify as a tribal cultural resource, the resource must be a site, feature, place, cultural landscape, sacred place, or object, which is of cultural value to a California Native American Tribe and is listed, or eligible for listing, on the national, state, or local register of historic resources. Lead agencies may

also use their discretion to treat any notable resource as a tribal cultural resource. To determine whether a project may have an impact on a resource, the lead agency is required to consult with any California Native American tribe that requests consultation and is affiliated with the geographic area of a proposed project (PRC § 21080.3.1). CEQA requires that a lead agency consider the value of the cultural resource to the tribe and consider measures to mitigate any adverse impact.

California Public Resources Code

Section 5097 of the Public Resources Code specifies the procedures to be followed in the event of the unexpected discovery of historic, archaeological, and paleontological resources, including human remains, historic or prehistoric resources, paleontological resources on nonfederal land. The disposition of Native American burial falls within the jurisdiction of the California Native American Heritage Commission (NAHC). Section 5097.5 of the Code states the following:

> *No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.*

California Health and Safety Code

Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission. CEQA Guidelines (Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

Senate Bill 18 (Burton, Chapter 905, Statutes 2004)

SB 18, authored by Senator John Burton and signed into law by Governor Arnold Schwarzenegger in September 2004, requires local (city and county) governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places ("cultural places") through local land use planning. This legislation, which amended §65040.2, §65092, §65351, §65352, and §65560, and added §65352.3, §653524, and §65562.5 to the Government Code; also requires the Governor's Office of Planning and Research (OPR) to include in the General Plan Guidelines advice to local governments for how to conduct these consultations. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to, cultural places. These consultation and notice requirements apply to adoption and amendment of both general plans (defined in Government Code §65300 et seq.) and specific plans (defined in Government Code §65450 et seq.).

Assembly Bill 978

In 2001, Assembly Bill (AB) 978 expanded the reach of Native American Graves Protection and Repatriation Act of 1990 and established a State commission with statutory powers to assure that Federal and State laws regarding the repatriation of Native American human remains and items of patrimony are fully complied with. In addition, AB 978 also included non-Federally recognized tribes for repatriation.

Assembly Bill 52

Assembly Bill (AB) 52, approved in September 2014, creates a formal role for California Native American tribes by creating a formal consultation process and establishing that a substantial adverse change to a tribal cultural resource has a significant effect on the environment. Tribal cultural resources are defined as:

1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
    A) Included or determined to be eligible for inclusion in the CRHR
    B) Included in a local register of historical resources as defined in PRC Section 5020.1(k)
2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1 (c). In applying the criteria set forth in PRC Section 5024.1 (c) the lead agency shall consider the significance of the resource to a California Native American tribe.

A cultural landscape that meets the criteria above is also a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape. In addition, a historical resource described in PRC Section 21084.1, a unique archaeological resource as defined in PRC Section 21083.2(g), or a “non-unique archaeological resource” as defined in PRC Section 21083.2(h) may also be a tribal cultural resource if it conforms with above criteria.

AB 52 requires a lead agency, prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project, to begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if: (1) the California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe, and (2) the California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation.

LOCAL REGULATIONS

City of Lake Forest Local Guidelines for Implementing the California Environmental Quality Act

In 2017, the City of Lake Forest adopted procedures to implement the California Environmental Quality Act ("CEQA"), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines ("State CEQA Guidelines"), 14 California Code of Regulations Section 15000 et seq. The procedures established herein implement and tailor the general provisions of the State CEQA Guidelines to the specific operations of the City of Lake Forest ("City"). These Local Guidelines are intended to supplement the State CEQA Guidelines" (City of Lake Forest 2017).

Section 5-1 specifically identifies the evaluation of impacts to historic (Section 5-1, l) archaeological (Section 5-1, m) resources, and tribal consultation requirements are included in Sections 7-f and 6-h): as described below:

L) EVALUATING IMPACTS ON HISTORIC RESOURCES

Projects that may cause a substantial adverse change in the significance of a historical resource, as defined in Local Guidelines Section 10.28, are projects that may have a significant effect on the environment, thus requiring consideration under CEQA. Particular attention and care should be given when considering such projects, especially projects involving the demolition of a historical resource, since such demolitions have been determined to cause a significant effect on the environment.

Substantial adverse change in the significance of a historical resource means physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings, such that the significance of a historical resource would be materially impaired. The significance of a historical resource is materially impaired when a project:

(1) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register of Historical Resources;
(2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources or its identification in a historical resources survey, unless the Lead Agency establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
(3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by the Lead Agency for purposes of CEQA.

Generally, a project that follows either one of the following sets of standards and guidelines will be considered mitigated to a level of less than significant: (a) the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring

and Reconstructing Historic Buildings; or (b) the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer.

In the event of an accidental discovery of a possible historical resource during construction of the project, the City may provide for the evaluation of the find by a qualified archaeologist or other professional. If the find is determined to be a historical resource, the City should take appropriate steps to implement appropriate avoidance or mitigation measures. Work on non-affected portions of the project, as determined by the City, may continue during the process. Curation may be an appropriate mitigation measure for an artifact that must be removed during project excavation or testing.

M) EVALUATING IMPACTS ON ARCHAEOLOGICAL SITES

When a project will impact an archaeological site, the City shall first determine whether the site is a historical resource, as defined in Local Guidelines Section 10.28. If the archaeological site is a historical resource, it shall be treated and evaluated as such, and not as an archaeological resource. If the archaeological site does not meet the definition of a historical resource, but does meet the definition of a unique archaeological resource set forth in Public Resources Code Section 21083.2, the site shall be treated in accordance with said provisions of the Public Resources Code. The time and cost limitations described in Section 21083.2(c-f) do not apply to surveys and site evaluation activities intended to determine whether the project site contains unique archaeological resources.

If the archaeological resource is neither a unique archaeological resource nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

In the event of an accidental discovery of a possible unique archaeological resource during construction of the project, the City may provide for the evaluation of the find by a qualified archaeologist. If the find is determined to be a unique archaeological resource, the City should take appropriate steps to implement appropriate avoidance or mitigation measures. Work on non-affected portions of the project, as determined by the City, may continue during the process. Curation may be an appropriate mitigation measure for an artifact that must be removed during project excavation or testing.

When an Initial Study identifies the existence of, or the probable likelihood of, Native American human remains within the Project, the City shall comply with the provisions of State CEQA Guidelines Section 15064.5(d). In the event of an accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the City shall comply with the provisions of State CEQA Guidelines Section 15064.5(e).

The City of Lake Forest Guideline specifically identifies tribal consultation requirements:

F) CONSULTATION WITH CALIFORNIA NATIVE AMERICAN TRIBES.

Prior to the release of a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration for a project, the lead agency shall begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if:

(1) The California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and
(2) The California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation. The California Native American tribe shall designate a lead contact person when responding to the lead agency. If a lead contact is not designated by the California Native American tribe, or it designates multiple lead contact people, the lead agency shall defer to the individuals listed on the contact list maintained by the Native American Heritage Commission. Consultation is defined in Local Guidelines Section 10.11.

H) CONSULTATION WITH CALIFORNIA NATIVE AMERICAN TRIBES.

Prior to the release of a Draft EIR for a project, the lead agency shall begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if:

(1) The California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and
(2) The California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation. The California Native American tribe shall designate a lead contact person when responding to the lead agency. If a lead contact is not designated by the California Native American tribe, or it designates multiple lead contact people, the lead agency shall defer to the individuals listed on the contact list maintained by the Native American Heritage Commission. Consultation is defined in Local Guidelines Section 10.11.

3.5.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project is considered to have a significant impact on cultural or tribal resources if it will:

- Cause a substantial adverse change in the significance of a historical resource pursuant to Section15064.5?
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?
- Disturb any human remains, including those interred outside of formal cemeteries?
- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
    - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?
    - A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1? In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resources to a California Native American tribe.

IMPACTS AND MITIGATION MEASURES

Impact 3.5-1: General Plan implementation could cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to Section15064.5 (Less than Significant)

A substantial adverse change in the significance of an historic resource is defined in Section 15064.5 (b)(1) of the CEQA Guidelines as the "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." Known historic and prehistoric resource sites are located throughout the Planning Area, as shown in Tables 3.5-1 through 3.5-3, and it is expected that additional undiscovered sites may be located in various areas of the city as well.

The City of Lake Forest currently has 93 previously recorded archaeological sites (87 prehistoric archaeological sites, five multicomponent sites, and one historic archaeological site), and six built historic resources within the City boundaries. Additionally, the historic core of "Old El Toro" bounded by Los Alisos Boulevard to the west, Second Street to the north, El Toro Road to the east, and Muirlands Boulevard to the south has the potential to be sensitive for subsurface historic archaeological deposits. The area immediately surrounding the Aliso Creek Watershed as well as

undeveloped ridge and knoll tops have the potential for subsurface prehistoric archaeological deposits. Details regarding the exact nature and location of archaeological resources are intentionally withheld from this EIR in order to help protect the integrity of these resources.

While the General Plan does not directly propose any adverse changes to any historic or archaeological resources, future development allowed under the General Plan could affect known historical and archaeological resources or unknown historical and archaeological resources which have not yet been identified. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the City's General Plan, Municipal Code, and other applicable State and local regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. In 2017, the City adopted procedures to implement the California Environmental Quality Act. Section 5-1 specifically identifies the evaluation of impacts to historic resources (Section 5-1, l) and archaeological resources (Section 5-1, m).

The General Plan includes policies and actions that would reduce impacts to cultural, historic, and archaeological resources, as well as policies and actions for the conservation of cultural, historic, and archaeological resources. Specifically, General Plan policies require development projects with a potential to impact archeological resources to be monitored by a relevant expert. In the event of a resource discovery, it is required that all ground disturbing activities and construction to be halted until a qualified expert is able to analyze the project site and determine appropriate mitigation. Additionally, the General Plan requires tribal consultation with tribes that may be impacted by proposed development, in accordance with state, local, and tribal intergovernmental consultation requirements. Adoption and implementation of the policies and actions listed below, combined with adopted CEQA review requirements, would ensure that adverse effects on significant historic and archaeological resources are reduced to a **less than significant** level**.**

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-3.1: Preservation. Protect areas of important historic, archaeological, and paleontologic resources.

RR-3.2: County of Orange Coordination. Coordinate with the County of Orange to preserve local historic resources, conserve historical assets within the City, and allow for local community events to occur at these special locations.

RR-3.3: Development. Ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.

RR-3.4: Tribal Consultation. Consult with Native American tribes that may be impacted by proposed development, as necessary, in accordance with state, local, and tribal intergovernmental consultation requirements.

ACTIONS

RR-3a: City staff shall require applicants for future proposed ground disturbing projects to provide a technical cultural resources assessment consisting of a record search, survey, background context and project specific recommendations performed by a qualified archaeologist meeting Secretary of the Interior Standards and certified by the County of Orange. If resources are known or reasonably anticipated the recommendations shall provide a detailed mitigation plan which shall require monitoring during grading and other earthmoving activities in undisturbed sediments, provide a treatment plan for potential resources that includes data to be collected, requires professional identification, other special studies as appropriate, requires curation at an accredited museum such as the John D. Cooper Center operated by the County of Orange for artifacts meeting significance criteria, requires a comprehensive final mitigation compliance report including a catalog of specimens with museum numbers and an appendix containing a letter from the museum stating that they are in possession of the materials.

RR-3c: City staff shall require applicants for future proposed projects with intact extant building(s) more than 45 years old to provide a historic resource technical study evaluating the significance and data potential of the resource. If significance criteria are met, detailed mitigation recommendations are required as part of the technical study. All work will be performed by a qualified architectural historian meeting Secretary of the Interior Standards.

Impact 3.5-2: Implementation of the General Plan could lead to the disturbance of any human remains (Less than Significant)

Indications are that humans have occupied areas near the Planning Area for at least 9,000 years and it is not always possible to predict where human remains may occur outside of formal burials. Therefore, excavation and construction activities allowed under the General Plan may yield human remains that may not be marked in formal burials.

Although Native American human remains are normally associated with former residential village locations, isolated burials and cremations have been found in many other locations. Future projects may disturb or destroy buried Native American human remains, including those interred outside of formal cemeteries. Consistent with state laws protecting these remains (that is, Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98), sites containing Native American human remains must be treated in a sensitive manner. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the City's General Plan, Municipal Code, and other applicable State and local regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. Under CEQA, human remains are protected under the definition of archaeological materials as being "any

evidence of human activity." Public Resources Code Section 5097 has specific stop-work and notification procedures to follow in the event that Native American human remains are inadvertently discovered during development activities. The General Plan requires that human remains are treated in compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98. Implementation of the policies and actions below ensures that potential adverse impacts to human remains would be **less than significant**.

GENERAL PLAN POLICIES AND ACTION THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-3.1: Preservation. Protect areas of important historic, archaeological, and paleontologic resources.

RR-3.3: Development. Ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.

RR-3.4: Tribal Consultation. Consult with Native American tribes that may be impacted by proposed development, as necessary, in accordance with state, local, and tribal intergovernmental consultation requirements.

ACTION

RR-3b: Require all new development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:

- *If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Director of Community Development shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Community Development Director; and*
- *If human remains are discovered during any ground disturbing activity, work shall stop until the Director of Community Development and the Orange County Coroner have been contacted. If the human remains are determined to be of Native American origin, the Native American Heritage Commission and the most likely descendants shall be consulted; and work may only resume when appropriate measures have been taken and approved by the Director of Community Development.*

Impact 3.5-3: Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074, and that is: Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or a resource determined by the lead agency (Less than Significant).

A Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on March 23, 2018. The NAHC replied the same day, and indicated that a search of the SFL was completed with positive results in the Santiago Peak USGS Quadrangle and that the Juaneño Band of Mission Indians should be contacted for more information about the site.

The City of Lake Forest conducted Native American consultations under Senate Bill 18 (Chapter 905, Statutes of 2004), also known as SB18, which requires local governments to consult with Tribes prior to making certain planning decisions and requires consultation and notice for a general and specific plan adoption or amendments in order to preserve, or mitigate impacts to, cultural places that may be affected. In addition to SB18 consultation, the City conducted tribal consultations under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)), also known as AB 52, which requires consulting for projects within the City of Lake Forest's jurisdiction and within the traditional territory of the Tribal Organizations who have previously requested AB52 consultations with the City. Four Tribal Organizations were contacted under AB52 and 11 were contacted under SB18.

The City of Lake Forest sent letters to all 15 Tribal Organizations on June 4, 2018 via certified mail. Follow-up emails were sent on June 26, 2018, and follow up phone calls were made on July 18, 2018; however, additional contact attempts were made to the Juaneño Band of Mission Indians Acjachemen Nation. To date, four responses have been received and are summarized below.

- On August 31, 2018 Ms. Joyce Perry of the Juaneño Band of Mission Indians Acjachemen Nation, via phone conversation, requested that the City of Lake Forest notify the Tribe regarding any development projects located within the City limits. She informed that the Santa Ana foothills and area around the Aliso Creek watershed are extremely sensitive for tribal cultural resources including ancestor remains.
- On August 31, 2018, Mr. Marcos Guerrero indicated that he believed the UAIC was placed on the City of Forest /Orange County list by accident.
- On June 12, 2018 Mr. Ray Teran indicated that Viejas Tribe has determined that the project has little cultural significance to the Viejas Tribe. He recommended that local Tribes be consulted.
- On July 18, 2018 the receptionist of the Jamul Indian Village indicated that the City of Lake Forest is off their reservation and outside of their traditional tribal territory and defers to local Tribes.

In 2017, the City of Lake Forest adopted procedures to implement the California Environmental Quality Act ("CEQA"), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines ("State CEQA Guidelines"), 14 California Code of Regulations Section 15000 et seq. The procedures established herein implement and tailor the general provisions of the State CEQA Guidelines to the specific operations of the City of Lake Forest ("City"). These Local Guidelines are intended to supplement the State CEQA Guidelines" (City of Lake Forest 2017).

The City of Lake Forest Guideline specifically identifies tribal consultation requirements:

> F) CONSULTATION WITH CALIFORNIA NATIVE AMERICAN TRIBES.
>
> Prior to the release of a Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration for a project, the lead agency shall begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if:
>
> (1) The California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and
>
> (2) The California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation. The California Native American tribe shall designate a lead contact person when responding to the lead agency. If a lead contact is not designated by the California Native American tribe, or it designates multiple lead contact people, the lead agency shall defer to the individuals listed on the contact list maintained by the Native American Heritage Commission. Consultation is defined in Local Guidelines Section 10.11.
>
> H) CONSULTATION WITH CALIFORNIA NATIVE AMERICAN TRIBES.
>
> Prior to the release of a Draft EIR for a project, the lead agency shall begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if:
>
> (1) The California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe; and
>
> (2) The California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation. The California Native American tribe shall designate a lead contact person when responding to the lead agency. If a lead contact is not designated by the California Native American tribe, or it designates multiple lead contact people, the lead agency shall defer to the

individuals listed on the contact list maintained by the Native American Heritage Commission. Consultation is defined in Local Guidelines Section 10.11.

While no specific resources have been identified through consultation with affiliated tribes, it is possible that unknown tribal cultural resources may be present and could be adversely affected by implementation of measures and strategies associated with the project. Additionally, through the consultation process it has been expressed that areas including the Santa Ana foothills and areas around the Aliso Creek watershed are sensitive for tribal cultural resources including ancestor remains, and that local tribes should continue to be notified as future development projects are proposed.

Specific locations for future development and improvements have not been identified. Future projects would be required to be evaluated for project-specific impacts under CEQA at the time of application. The General Plan and local CEQA guidelines require tribal consultation and the protections of any identified archeological and tribal resources. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

All future development projects would be required to follow development requirements, including compliance with local policies, ordinances, and applicable permitting procedures related to protection of tribal resources. Subsequent projects would be required to prepare site-specific project-level analysis to fulfill CEQA requirements, which also would include additional AB 52 consultation that could lead to the identification of potential site specific tribal resources

As discussed under impact discussions 3.5-1 and 3.5-2, impacts from future development could impact unknown archaeological resources including Native American artifacts and human remains. Impacts would be reduced to a less-than-significant level with implementation of General Plan policies and actions and local review guidelines. Compliance with the General Plan policies and actions, as well as State and local guidelines would provide an opportunity to identify, disclose, and avoid or minimize the disturbance of and impacts to a tribal resource through tribal consultation and CEQA review procedures. Therefore, impacts related to tribal resources as a result of General Plan implementation would be considered **less than significant**.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-3.1: Preservation. Protect areas of important historic, archaeological, and paleontologic resources.

RR-3.2: County of Orange Coordination. Coordinate with the County of Orange to preserve local historic resources, conserve historical assets within the City, and allow for local community events to occur at these special locations.

RR-3.3: Development. Ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.

RR-3.4: Tribal Consultation. Consult with Native American tribes that may be impacted by proposed development, as necessary, in accordance with state, local, and tribal intergovernmental consultation requirements.

ACTIONS

RR-3a: City staff shall require applicants for future proposed ground disturbing projects to provide a technical cultural resources assessment consisting of a record search, survey, background context and project specific recommendations performed by a qualified archaeologist meeting Secretary of the Interior Standards and certified by the County of Orange. If resources are known or reasonably anticipated the recommendations shall provide a detailed mitigation plan which shall require monitoring during grading and other earthmoving activities in undisturbed sediments, provide a treatment plan for potential resources that includes data to be collected, requires professional identification, other special studies as appropriate, requires curation at an accredited museum such as the John D. Cooper Center operated by the County of Orange for artifacts meeting significance criteria, requires a comprehensive final mitigation compliance report including a catalog of specimens with museum numbers and an appendix containing a letter from the museum stating that they are in possession of the materials.

RR-3b: Require all new development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of cultural resources or human remains:

- *If construction or grading activities result in the discovery of significant historic or prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Community Development Director shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when appropriate protections are in place and have been approved by the Community Development Director; and*

- *If human remains are discovered during any ground disturbing activity, work shall stop until the Community Development Director and the Orange County Coroner have been contacted. If the human remains are determined to be of Native American origin, the Native American Heritage Commission and the most likely descendants shall be consulted; and work may only resume when appropriate measures have been taken and approved by the Community Development Director.*

This section provides a background discussion of the seismic and geologic hazards found in the City and the regional vicinity. This section is organized with an environmental setting, regulatory setting, and impact analysis.

No comments on this environmental topic were received during the NOP comment period.

3.6.1 ENVIRONMENTAL SETTING

Lake Forest is located in central Orange County, approximately 11 miles east of Irvine and 19 miles northeast of San Clemente. The City of Lake Forest is near the coastal margin of the Los Angeles Basin, which includes Orange County, and is underlain by more than 15,000 feet of stratified sedimentary rocks of marine origin. The regional geologic framework of the Los Angeles Basin area can be understood through the theory of plate tectonics. Earth's mantle is composed of several large plates that move relative to each other and are bounded by major fault zones. The San Fault zone, about 40 miles northeast of the City of Lake Forest, is the boundary between the Pacific Plate, on the west side of the zone, and the North American Plate on the east side. One of the results of the movement of these plates is the regional rock deformation that is expressed in the general northwest trend of valleys and ridges in the Los Angeles Basin. All of the geologic formations in the Los Angeles Basin are on the Pacific Plate. The Santa Monica and San Gabriel Mountains, about 50 miles north of the City of Lake Forest, form the northern boundary of the Los Angeles Basin, and are part of the Transverse Ranges Geomorphic Province, which is characterized by east-west trending faults, folds, and mountain ranges. The Santa Ana Mountains and adjacent hills are located in the northeastern portion of the City and form the eastern boundary of the Los Angeles Basin. The Santa Ana Mountains are part of the Peninsular Ranges Geomorphic Province, which is characterized by northwest-southeast trending faults, folds, and mountain ranges. Both of these provinces, as well as the Los Angeles Basin, are considered to be highly active seismically.

The City of Lake Forest comprises about 17 square miles in a transition zone between an elevated coastal terrace and the Santa Ana Mountains. The western portion of the City, on the coastal terrace, is about 200 feet amsl. The land becomes progressively higher and steeper to the east, eventually reaching elevations above 1,500 feet amsl along the ridgeline of the Santa Ana Mountains. Traces of fault segments associated with the Newport-Inglewood Fault Zones parallel the ocean edge of the coastal terrace. Traces of the Elsinore Fault Zone follow the ridge of the Santa Ana Mountains (Yerkes 1965).

The geology of the region is complex and has undergone several alternating periods of subsidence and uplift, mass wasting (erosion), and sediment deposition. In the Santa Ana Mountains igneous, metavolcanic, and metasedimentary rocks of Jurassic age (208 million to 144 million years ago) and younger form the core of the range. The exposed rocks in the mountainous areas are slightly metamorphosed volcanics, which have been intruded by granitic rocks of Cretaceous age (144 million to 66.4 million years ago), principally granites, gabbros, and tonalites. Overlying these rocks are about 15,000 feet of younger sandstones, siltstones, and conglomerates of upper Cretaceous age, composed largely of material eroded from the older igneous and metavolcanic rocks now underlying the Santa Ana Mountains.

GEOMORPHIC PROVINCE

California's geomorphic provinces are naturally defined geologic regions that display a distinct landscape or landform. Earth scientists recognize eleven provinces in California. Each region displays unique, defining features based on geology, faults, topographic relief, and climate. These geomorphic provinces are remarkably diverse. They provide spectacular vistas and unique opportunities to learn about Earth's geologic processes and history. Lake Forest lies within the Los Angeles Basin geomorphic province.

The Los Angeles Basin geomorphic province is an alluviated lowland, sometimes called the coastal plain, which is bounded on the north by the Santa Monica Mountains and the Elysian, Repetto, and Puente Hills and on the east and southeast by the Santa Ana Mountains and San Joaquin Hills. The low land surface slopes gently south or seaward, but it is interrupted by the Coyote Hills near the northeast margin, by a line of elongated low hills and mesas to the south and west that extends from Newport Bay northwest to Beverly Hills, and by the Palos Verdes peninsula at the southwest extremity. The physiographic basin is underlain by a structural depression, parts of which have been the sites of discontinuous deposition since Late Cretaceous time and of continuous subsidence and chiefly marine deposition since middle Miocene time. The Los Angeles basin is notable for its great structural relief and complexity in relation to its geologic youth and small size and for its prolific oil production.

REGIONAL GEOLOGY

The geology of southern California formed as a result of complex plate tectonics and fault movement. The most notable fault in southern California, the San Andreas Fault, is a right lateral strike-slip (or transform) fault that marks the boundary between the Pacific tectonic plate and the North American tectonic plate. Both plates are moving northward, but the Pacific plate is moving at a faster rate than the North American plate and the relative difference in the two rates results in movement along the San Andreas Fault. Northwest of the Los Angeles basin, where the southern San Joaquin Valley meets the San Emigdio and Tehachapi Mountains, the orientation of the San Andreas Fault changes from generally northwest to west-northwest. This portion of the fault system is known as the "Big Bend". Another large fault in southern California, the left-lateral Garlock Fault, intersects the San Andreas Fault system at this location. This bend in the San Andreas Fault system results in transpressional forces between the two tectonic plates, a geologic result of which was the uplift of the Transverse Ranges, including the San Gabriel Mountains that rise to the north of the City.

The compression between the two plates also resulted in the formation of numerous reverse and thrust faults throughout the Los Angeles Basin. Several of these thrust faults are located near the City of Lake Forest and are discussed in more detail below. South of the Big Bend, several other major strike-slip faults, including the San Jacinto and the Elsinore faults, parallel the trace of the San Andreas Fault.

The Los Angeles Basin is an alluviated lowland, or coastal plain, underlain by a structural depression. Deposition of mostly marine sediments has occurred sporadically since the Late

Cretaceous period and continuously since the middle Miocene period. This marine and non-marine deposition over a long geologic timeframe resulted in a layer of organic-rich sediments that is up to several miles thick in some places. These organic-rich sediments are the source of the vast petroleum reserves extracted from the basin throughout the twentieth century.

SEISMIC HAZARDS

Seismic hazards include both rupture (surface and subsurface) along active faults and ground shaking, which can occur over wider areas. Ground shaking, produced by various tectonic phenomena, is the principal source of seismic hazards in areas devoid of active faults. All areas of the state are subject to some level of seismic ground shaking.

Several scales may be used to measure the strength or magnitude of an earthquake. Magnitude scales (ML) measure the energy released by earthquakes. The Richter scale, which represents magnitude at the earthquake epicenter, is an example of an ML. As the Richter scale is logarithmic, each whole number represents a 10-fold increase in magnitude over the preceding number. Table 3.6-1 represents effects that would be commonly associated with Richter Magnitudes.

TABLE 3.6-1: RICHTER MAGNITUDES AND EFFECTS

MAGNITUDE	*EFFECTS*
< 3.5	Typically not felt
3.5 – 5.4	Often felt but damage is rare
5.5 – < 6	Damage is slight for well-built buildings
6.1 – 6.9	Destructive potential over ±60 miles of occupied area
7.0 – 7.9	"Major Earthquake" with the ability to cause damage over larger areas
≥ 8	"Great Earthquake" can cause damage over several hundred miles

SOURCE: USGS, EARTHQUAKE PROGRAM.

Historically active regional faults and their associated size and frequency are shown in Table 3.6-2.

TABLE 3.6-2: PRINCIPAL HISTORICALLY ACTIVE AND ACTIVE FAULTS IN THE REGION

FAULT	*MAXIMUM MOMENT MAGNITUDE*	*HISTORICAL SEISMICITY (LAST 150 YEARS)*	*SLIP RATE (MM/YEAR)*
Newport-Inglewood	7.1	M 6.4 (1933)	1.0
Palos Verdes	7.3	--	3.0
San Andreas (Mojave Section)	7.4	M 7.0 (1899)	30.0
San Jacinto	7.2	--	--
Santa Monica	6.6	--	1.0
Sierra Madre (San Fernando Section)	6.7	M 6.4 (1971)	2.0
Whittier-Elsinore	6.8	M 5.9 (1987)	2.5

SOURCE: USGS, 2003, 2010.

The 2015 Uniform California Earthquake Rupture Forecast, Version 3, or UCERF3, is the latest official earthquake rupture forecast (ERF) for the state of California. It provides estimates of the likelihood and severity of potentially damaging earthquake ruptures in the long- and near-term. Combining this with ground motion models produces estimates of the severity of ground shaking

that can be expected during a given period (seismic hazard), and of the threat to the built environment (seismic risk). This information is used to inform engineering design and building codes, plan for disaster, and evaluate whether earthquake insurance premiums are sufficient for the prospective losses.

UCERF3 was prepared by the Working Group on California Earthquake Probabilities (WGCEP), a collaboration between the United States Geological Survey (USGS), the California Geological Survey (CGS), and the Southern California Earthquake Center (SCEC), with significant funding from the California Earthquake Authority (CEA). The UCERF3 Model represents the latest model from the Working Group on California Earthquake Probabilities (WGCEP) (WGCEP, 2014). Results for the Los Angeles region faults based on the UCERF3 are shown in Table 3.6-3.

TABLE 3.6-3: LIKELIHOOD OF HAVING ONE OR MORE EARTHQUAKES BY SIZE IN THE NEXT 30 YEARS (STARTING FROM 2014)

MAGNITUDE (GREATER THAN OR EQUAL TO)	*AVERAGE REPEAT TIME (YEARS)*	*30-YEAR LIKELIHOOD OF ONE OR MORE EVENTS*	*READINESS*
5	1.4	100%	1.0
6	10	96%	1.0
6.7	40	60%	1.1
7	61	46%	1.2
7.5	109	31%	1.3
8	532	7%	1.3

SOURCE: US DEPARTMENT OF THE INTERIOR U.S. GEOLOGICAL SURVEY (2015).

The Working Group on California Earthquake Probabilities predicts that the probability that an earthquake will occur in the Los Angeles region within the next 30 years is:

- 60% that an earthquake measuring magnitude 6.7 will occur;
- 46% that an earthquake measuring magnitude 7 will occur;
- 31% that an earthquake measuring magnitude 7.5 will occur.

In contrast, other scales describe earthquake intensity, which can vary depending on local characteristics. The Modified Mercalli Scale (MM) expresses earthquake intensity at the surface on a scale of I through XII. The Lake Forest area could experience considerable ground shaking generated by faults within or near the City of Lake Forest. For example, Lake Forest could experience an intensity of MM X generated by seismic events occurring along the Sierra Madre fault. Table 3.6-4 represents the potential effects of an earthquake based on the Modified Mercalli Intensities.

TABLE 3.6-4: MODIFIED MERCALLI INTENSITIES AND EFFECTS

MM	*EFFECTS*
I	Movement is imperceptible
II	Movement may be perceived (by those at rest or in tall buildings)
III	Many feel movement indoors; may not be perceptible outdoors
IV	Most feel movement indoors; Windows, doors, and dishes will rattle
V	Nearly everyone will feel movement; sleeping people may be awakened
VI	Difficulty walking; Many items fall from shelves, pictures fall from walls
VII	Difficulty standing; Vehicle shaking felt by drivers; Some furniture breaks
VIII	Difficulty steering vehicles; Houses may shift on foundations
IX	Well-built buildings suffer considerable damage; ground may crack
X	Most buildings and foundations and some bridges destroyed
XI	Most buildings collapse; Some bridges destroyed; Large cracks in ground
XII	Large scale destruction; Objects can be thrown into the air

SOURCE: USGS GENERAL INTEREST PUBLICATION 1989-288-913.

FAULTS

Faults are classified as Historic, Holocene, Late Quaternary, Quaternary, and Pre-Quaternary according to the age of most recent movement. These classifications are described as follows:

- **Historic:** faults on which surface displacement has occurred within the past 200 years;
- **Holocene:** shows evidence of fault displacement within the past 11,000 years, but without historic record;
- **Late Quaternary:** shows evidence of fault displacement within the past 700,000 years, but may be younger due to a lack of overlying deposits that enable more accurate age estimates;
- **Quaternary:** shows evidence of displacement sometime during the past 1.6 million years;
- **Pre-Quaternary:** without recognized displacement during the past 1.6 million years.

Faults are further distinguished as active, potentially active, or inactive:

- **Active:** An active fault is a Historic or Holocene fault that has had surface displacement within the last 11,000 years;
- **Potentially Active:** A potentially active fault is a pre-Holocene Quaternary fault that has evidence of surface displacement between about 1.6 million and 11,000 years ago; and
- **Inactive:** An inactive fault is a pre-Quaternary fault that does not have evidence of surface displacement within the past 1.6 million years. The probability of fault rupture is considered low; however, this classification does not mean that inactive faults cannot, or will not, rupture.

The most significant active fault traces in the vicinity of the City of Lake Forest are along the Newport-Inglewood and Elsinore fault zones, which are considered active. Figure 3.6-1 illustrates the location of local faults within the vicinity of Lake Forest. There are numerous active faults

located in the regional vicinity of Lake Forest. Below is a brief summary of the most notable faults in the regional vicinity:

- **Newport-Inglewood Fault**: The Newport-Inglewood Fault zone was responsible for both the 1933 Long Beach Earthquake (magnitude M6.3) and the 1920 Inglewood Earthquake (estimated magnitude M4.9). This zone is visible on the surface as a series of northwest trending elongated hills extending from Newport Beach to Beverly Hills, including Signal Hill and Dominguez Hills. The fault zone exhibits as much as 6,000 feet of right lateral displacement that has occurred since mid-Pliocene time, about 3.4 million years ago, with a maximum displacement of 10,000 feet since late Miocene time, at least 5.3 million years ago (Woodward-Clyde Consultants 1979). An estimated characteristic earthquake of MW 7.1 is assigned to the zone based on its estimated rupture length and slip rate. Active or potentially active fault segments of the Newport-Inglewood Fault zone closest to Lake Forest include the north and south branches of the Newport-Inglewood Fault. The City of Lake Forest is 10 to 14 miles northeast of these fault segments, which places it just outside the CBC Near-Source Area for known active faults.
- **Palos Verdes Fault**: The Palos Verdes Fault zone trends southeast offshore through San Pedro Bay about 26 miles southwest of Lake Forest. The fault is thought to contain active segments (CBC Seismic Source Type B) that could produce severe seismic shaking in the City of Lake Forest. One of several major faults of similar trend in Southern California, the Palos Verdes Fault is nearly parallel in orientation to the Newport-Inglewood Fault zone. The characteristic earthquake for the Palos Verdes Fault is MW 7.1, based on comparisons with the Newport-Inglewood zone.
- **San Andreas Fault**: The San Andreas Fault zone trends east-southeast about 43 miles northeast of Lake Forest. This fault is widely recognized as the longest and most active fault in the state. It has been mapped from Cape Mendocino in northern California to an area near the Mexican border, approximately 500 miles. Abundant evidence of historic earthquakes indicates that the fault is active, including those that have caused extensive surface rupture and displacement of recent sediments. Current work indicates that large earthquakes have occurred along the fault at widely varying intervals, but averaging 160 years. A maximum probable earthquake of M 8.3 (magnitude of 8.3 on the Richter Scale) has been assigned to the San Andreas in Southern California (City of Lake Forest NHMP 2012).
- **San Jacinto Fault**: This active fault is similar to the San Andreas in that it is a large strike-slip fault that has been active for several million years. It has been the principal focus of historical release of strain in Southern California between the North American continental plate and Pacific Ocean plate. Surface rupture has been associated with several historic earthquakes on the fault. A maximum probable earthquake for the San Jacinto of M 7.2 is based upon historic seismicity and rupture length. (City of Lake Forest NHMP 2012). The San Jacinto Fault Zone trends southeast about 35 miles northeast of Lake Forest. The fault contains active segments (CBC Seismic Source Type A) that would cause severe seismic shaking in the City.

- **Santa Monica-Raymond Fault**: The Santa Monica–Raymond Fault Zone trends east about 42 miles northwest of Lake Forest. The fault is thought to contain active segments (CBC Seismic Source Type B) that could produce severe seismic shaking in the City. The characteristic earthquake for the Santa Monica and Raymond faults is MW 6.6. There is evidence that at least eight surface-rupturing events have occurred along the fault in this area during the last 36,000 years, but none in historic times.
- **Sierra Madre Fault**: The Sierra Madre Fault Zone Segment E (Cucamonga Fault Zone) trends east about 32 miles north of Lake Forest. The fault is thought to contain active segments (CBC Seismic Source Type B) that could produce severe seismic shaking in the City. The characteristic earthquake for the Cucamonga fault is MW 7.0. Segment E represents the easternmost part of the Sierra Madre Fault Zone, and at its eastern end, it meets several other faults including several; traces of the San Jacinto Fault. The general trend of the fault zone continues east along the base of the San Gabriel Mountains.
- **Whittier-Elsinore Fault**: This active fault parallels the San Jacinto Fault and is approximately 14 miles northeast of the City. In 1987, an M 5.9 earthquake occurred along a previously unknown thrust fault attached to this system. A maximum probable of M6.7 is assigned to the combined Whitter-Elsinore Fault (City of Lake Forest NHMP 2012). The fault contains active segments (CBC Seismic Source Type A) that would cause severe seismic shaking in the City. At 112 miles in length, the Elsinore Fault Zone is one of the largest in Southern California, and in historic times, has been one of the least active. At its northern end, the Elsinore fault splays into two segments, the Chino fault and the Whittier fault.

SEISMIC HAZARD ZONES

Alquist-Priolo Fault Zones

An active earthquake fault, per California's Alquist-Priolo Act, is one that has ruptured within the Holocene Epoch (≈11,000 years). Based on this criterion, the California Geological Survey identifies Earthquake Fault Zones. These Earthquake Fault Zones are identified in Special Publication 42 (SP42), which is updated as new fault data become available. The SP42 lists all counties and cities within California that are affected by designated Earthquake Fault Zones. The Fault Zones are delineated on maps within SP42 (Earthquake Fault Zone Maps).

Southern California is a region of high seismic activity. Similar to most cities in the region, the City of Lake Forest is subject to risks associated with potentially destructive earthquakes. The Planning Area is located in the seismically active southern California region, but not within an Earthquake Study Zone defined by the Alquist-Priolo Earthquake Hazards Act.

Seismic Hazard Zones

The State Seismic Hazards Mapping Act (1990) addresses hazards along active faults. The Southern California counties affected by the Program include San Bernardino, Los Angeles, Orange, and Ventura. Seismic hazard zones are currently mapped in Lake Forest, and include areas mapped for liquefaction and earthquake induced landslide hazards.

LIQUEFACTION

Liquefaction, which is primarily associated with loose, saturated materials, is most common in areas of sand and silt or on reclaimed lands. Cohesion between the loose materials that comprise the soil may be jeopardized during seismic events and the ground will take on liquid properties. Thus, specific soil characteristics and seismic shaking must exist for liquefaction to be possible. Liquefaction susceptibility based on soil types, deposit, and age is presented below.

Liquefaction Zones are areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required. Figure 3.6-2 shows liquefaction seismic hazard zones mapped within the City of lake Forest, which delineates areas where liquefaction may occur during a strong earthquake. Areas along existing waterways, such as Borrego Canyon Wash, Serrano Creek, and Aliso Creek, are defined as having the greatest potential for liquefaction. Table 3.6-5 provides liquefaction potential based on sediment type and age of deposit.

TABLE 3.6-5: LIQUEFACTION POTENTIAL BASED ON SEDIMENT TYPE AND AGE OF DEPOSIT

SEDIMENT	*SUSCEPTIBILITY BASED ON AGE OF DEPOSITS (YEARS BEFORE PRESENT)*			
	MODERN (< 500 YEARS)	*HOLOCENE (< 10,000)*	*PLEISTOCENE (< 2MILLION)*	*PRE-PLEISTOCENE (> 2 MILLION)*
River Channel	Very High	High	Low	Very Low
Flood Plain	High	Moderate	Low	Very Low
Alluvial Fan/Plain	Moderate	Low	Low	Very Low
Lacustrine/Playa	High	Moderate	Low	Very Low
Colluvium	High	Moderate	Low	Very Low
Talus	Low	Low	Very Low	Very Low
Loess	High	High	High	- ? -
Glacial Till	Low	Low	Very Low	Very Low
Tuff	Low	Low	Very Low	Very Low
Tephra	High	High	- ? -	- ? -
Residual Soils	Low	Low	Very Low	Very Low
Sebka	High	Moderate	Low	Very Low
Un-compacted Fill	Very High	NA	NA	NA
Compacted fill	Low	NA	NA	NA

SOURCE: YOUD AND PERKINS, 1978

EARTHQUAKE-INDUCED LANDSLIDES

Earthquake-Induced Landslide Zones Areas are areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required. Figure 3.6-3 shows the earthquake-induced landslide seismic hazard zones mapped within the City of Lake Forest. Most areas susceptible to landslides are located in the higher-elevation portions of the City.

OTHER GEOLOGIC HAZARDS

Soils

According to the Natural Resource Conservation Service (2018), there are 30 different soil series located in the City of Lake Forest. Table 3.6-6 below, and Figure 3.6-4 presents the soils located in the City of Lake Forest.

TABLE 3.6-6: CITY OF LAKE FOREST SOILS

SOILS TYPE	*ACRES*
Alo Clay/clay variant	67.23
Anaheim clay loam	85.43
Balcom clay loam	395.76
Blasingame stony loam	4.32
Bosanko clay	308.16
Bosanko-Balcom complex	36.99
Botella loam/clay loam	70.74
Calleguas clay loam	828.06
Capistrano sandy loam	944.80
Chino silty clay loam	9.44
Cieneba sandy loam	2,487.08
Cieneba-Rock outcrop complex	310.46
Corralitos loamy sand	458.52
Cropley clay	72.80
Metz loamy sand	0.32
Mocho loam	46.57
Modjeska gravelly loam	9.94
Myford sandy loam	3,218.91
Pits	8.19
Rincon	15.10
Riverwash	218.53
Rock outcrop-Cieneba complex	39.31
San Andreas sandy loam	147.68
San Emigdio fine sandy loam	8.56
Soboba cobbly loam sand	10.95
Soper loam/gravelly loam	21.24
Sorrento loam/clay loam/sandy loam	799.11
Water	6.87
Xeralfic arents, loamy	42.38
Yorba cobbly/gravelly sand loam	68.82

SOURCE: NATURAL RESOURCE CONSERVATION SERVICE, 2018.

Erosion

The U.S. Natural Resource Conservation Service (NRCS) delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of erosion factors is provided by the NRCS Physical Properties Descriptions:

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. Erosion factor Kw indicates the erodibility of the whole soil, whereas Kf indicates the erodibiity of the fine soils. The estimates are modified by the presence of rock fragments.

Soil erosion data for the City of Lake Forest was obtained from the NRCS. As identified by the NRCR web soil survey, the erosion factor K within the City of Lake Forest varies widely. The NRCS does not provide erosion factors for the urban land soils in the City, however, the erosion potential for the urban land soils in the City is considered to be low.

Expansive Soils

The NRCS delineates soil units and compiles soils data as part of the National Cooperative Soil Survey. The following description of linear extensibility (also known as shrink-swell potential or expansive potential) is provided by the NRCS Physical Properties Descriptions:

"Linear extensibility" refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

The linear extensibility of the soils within Lake Forest ranges from Low to Very High. Figure 3.6-5 illustrates the shrink-swell potential of soils in the City of Lake Forest. The majority of the City of Lake Forest has low potential for expansive soils, including most of the developed land. The areas with moderate to high expansive soils represent only a small portion of the City of Lake Forest, and would require special design considerations due to shrink-swell potentials.

Landslide

The California Geological Survey classifies landslides with a two-part designation based on Varnes (1978) and Cruden and Varnes (1996). The designation captures both the type of material that failed and the type of movement that the failed material exhibited. Material types are broadly categorized as either rock or soil, or a combination of the two for complex movements. Landslide movements are categorized as falls, topples, spreads, slides, or flows.

Landslide potential is influenced by physical factors, such as slope, soil, vegetation, and precipitation. Landslides require a slope, and can occur naturally from seismic activity, excessive saturation, and wildfires, or from human-made conditions such as construction disturbance, vegetation removal, wildfires, etc.

Figure 3.6-6 illustrates the landslide potential (for non-seismically included potential) in the vicinity of the City of Lake Forest. The landslide potential is relatively low in the southwestern portion of the City, where elevation change is relatively low. However, the landslide potential increases in the central and northern portions of the City, which contains areas with increased elevation change.

Subsidence

Subsidence is the settlement of soils of very low density generally from either oxidation of organic material, or desiccation and shrinkage, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Drainage sufficient to create subsidence is uncommon within the City of Lake Forest.

Collapsible Soils

Hydroconsolidation occurs when soil layers collapse, or settle, as water is added under loads. Natural deposits susceptible to hydroconsolidation are typically aeolian, alluvial, or colluvial materials, that have a high apparent strength when dry. The dry strength of the materials may be attributed to the clay and silt constituents in the soil and the presence of cementing agents (i.e., salts). Capillary tension may tend to act to bond soil grains. Once these soils are subjected to excessive moisture and foundation loads, the constituency including soluble salts or bonding agents is weakened or dissolved, capillary tensions are reduced and collapse occurs resulting in settlement. Existing alluvium within the City of Lake Forest may be susceptible to collapse and excessive settlements, which could create the risk of hydroconsolidation if these soils were exposed to excessive moisture.

PALEONTOLOGICAL RESOURCES

A Paleontological and Cultural Resources Assessment was completed for the General Plan Update (Cogstone Resource Management Inc., 2018).

The City has a complicated paleoenvironmental history which began at the age of dinosaurs about 66 million years old. Since that time, the City has transitioned from: coastal lowlands during the Paleocene to Oligocene, to shallow marine during the early Miocene, to deep marine during the early to early-late Miocene, back to shallow marine in the latest Miocene through the Pliocene, and finally to increasingly arid terrestrial deposits from the Pleistocene to the Holocene.

A search for paleontological records within the vicinity of the Planning Area was completed by the Natural History Museum of Los Angeles County. Published literature, unpublished paleontological reports, and online databases were also searched for fossil records. Databases included the Natural History Museum of Los Angeles County Invertebrate Paleontology, the Paleobiology Database, and the University of California Museum of Paleontology.

The artificial fill and Holocene sediments in the Planning Area do not contain fossil resources due to their age, by nature of their formation, or paleoenvironment. Although the Paleocene Silverado Formation and Santiago Formation, as well as the Pleistocene alluvial deposits, have produced fossils within Orange County, there are no records of fossils from these formations within the City. The rest of the formations have produced fossils from within the City. Formations are discussed from oldest to youngest.

Paleocene: Silverado Formation

At least 25 fossils of marine snails and bivalves have been recovered from the northwestern Santa Ana Mountains in Orange County. Sixteen localities were recovered from the Black Star Canyon 7.5' USGS topographic quadrangle and a single locality was recovered from the Orange 7.5' USGS topographic quadrangle. The Eastern Transportation Corridor (ETC) database listed one potential Silverado Formation locality from the El Toro 7.5' USGS topographic quadrangle which produced plant fossils.

Paleocene: Santiago Formation

At least 100 fossils of marine snails and bivalves have been recovered from this formation in the northwestern Santa Ana Mountains in Orange County. Eleven localities were recovered from the Black Star Canyon 7.5' USGS topographic quadrangle, four localities were recovered from the El Toro 7.5' USGS topographic quadrangle, three localities were recovered from the Orange 7.5' USGS topographic quadrangle, and a single locality was recovered from the Tustin 7.5' USGS topographic quadrangle. The Orange County Paleontological Database listed one locality from the Black Star Canyon 7.5' USGS topographic quadrangle which produced a crocodile and plant fossils.

Late Eocene to Latest Early Miocene: Sespe Formation

At least 25 fossils of terrestrial animals have been recovered from 17 localities in the Sespe Formation in Orange County. Two localities were recovered from the Lower Bowerman Landfill, nine localities were recovered from the Upper Bowerman Landfill, four localities were recovered from the Foothill Transportation Corridor-Oso segment, a locality was recovered from the San Joaquin Hills, and a locality was recovered from the San Joaquin Hills. The OCPC listed one locality from the El Toro 7.5' USGS topographic quadrangle. These localities have produced fossils of canine, weasel, peccary, oreodont, camel, musk deer, opossum, shrew, pika, squirrel, rodent, and iguana.

Early Miocene: Vaqueros-Sespe Formation

At least 2,400 fossils of terrestrial animals and plants have been recovered from 122 localities in the Vaqueros-Sespe Formation in Orange County. These localities have produced fossils of canine, bear, weasel, rhinoceros, horse, peccary, pig-like artiodactyl, oreodont, camel, deer-like artiodactyl, musk deer, hedgehog, shrew, pika, rabbit, squirrel, rodent, opossum, and reptile.

Early Miocene: Vaqueros Formation

At least 150 fossils of marine animals have been recovered from 24 localities in the Vaqueros Formation in Orange County. These localities have produced fossils of baleen and toothed whales, sea cows, birds, sea turtles, bony fish, sharks and rays, and invertebrates.

Middle Miocene: Topanga Group

At least 375 fossils of marine and terrestrial animals have been recovered from 37 localities in the Topanga Group in Orange County. These localities have produced fossils of pinnipeds, baleen and toothed whales, dugongs, sea cows, desmostylians, proboscideans, rodents, birds, sea turtles, bony fish, sharks, rays, and invertebrates.

Late Miocene: Monterey Formation

At least 150 fossils of marine animals have been recovered from 31 localities within and near to the City of Lake Forest. These localities have produced fossils of pinnipeds, baleen and toothed whales, dugongs, desmostylians, birds, crocodile, sea turtles, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities.

Late Miocene: Puente Formation

At least 275 fossils of marine animals have been recovered from 32 localities from the La Vida Member. These localities have produced fossils of sea lions, desmostylians, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities. A fossil of a herring has been recovered a locality in the Soquel Member. Two fossils of bony fish have been recovered in undifferentiated Puente Formation.

Late Miocene to Early Pliocene: Capistrano Formation

At least 375 fossils of marine and terrestrial animals have been recovered from 33 localities from the Oso Sand of the Capistrano Formation. These localities have produced fossils of pinnipeds, rodents, camels, baleen and toothed whales, horses, rhinoceros, mastodon, dugong, sea cows, desmostylians, birds, sea turtles, tortoise, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities.

At least 100 fossils of marine and terrestrial animals have been recovered from 30 localities from undifferentiated deposits of Capistrano Formation. These localities have produced fossils of pinnipeds, camels, baleen and toothed whales, horses, birds, sea turtles, tortoise, crocodile, bony fish, sharks and rays, and invertebrates.

Pliocene: Niguel Formation

An unknown number of fossils of marine and terrestrial animals have been recovered from four localities from undifferentiated deposits of Niguel Formation. These localities have produced fossils of camels, baleen whales, dugongs, and bony fish.

Pliocene to Pleistocene: Niguel Formation – Quaternary Terrace

A fossil of a sea lion and a camel have been recovered two localities in Niguel Formation – Quaternary terrace deposits.

Pleistocene Deposits

At least 225 fossils of terrestrial animals have been recovered from 29 localities from Pleistocene deposits outside of the City of Lake Forest. These localities have produced fossils of ground sloth, short faced bear, American lion, mammoth, mastodon, horses, ancient bison, shrews, reptiles, and amphibians. The most significant of these localities is Costeau Pit located in the City of Laguna Hills, just south of Lake Forest which has additionally produced coyote, dire wolf, saber-toothed cat, camel, llama, diminutive pronghorn, long-horned bison, rabbits, rodents, and birds.

The following units include Pleistocene sediments:

- Quaternary very old axial channel deposits (Qvoa, Qvoa2, Qvoa3); early to middle Pleistocene;
- Quaternary very old alluvial fan deposit (Qvof); early to middle Pleistocene;
- Quaternary young axial channel deposit (Qya); late Pleistocene to Holocene;
- Quaternary young alluvial fan deposit (Qyf); late Pleistocene to Holocene; and
- Quaternary young landslide deposit (Qyls); late Pleistocene to Holocene.

Holocene Deposits

No fossils are known from any of the Holocene deposits as they are all too young to contain fossils. The following units are Holocene in age:

- Very young colluvial deposits (Qc); late Holocene;
- Very young slope wash deposits (Qsw); late Holocene;
- Very young landslide deposits (Qls); late Holocene; and
- Artificial fill; modern.

3.6.2 REGULATORY SETTING

FEDERAL REGULATIONS

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act of 1977 (42 USC, 7701 et seq.) requires the establishment and maintenance of an earthquake hazards reduction program by the Federal government.

Executive Order 12699

Signed in January 1990, this executive order of the President implements provisions of the Earthquake Hazards Reduction Act for “federal, federally assisted or federally regulated new building construction” and requires the development and implementation of seismic safety programs by Federal agencies.

International Building Code (IBC)

The purpose of the International Building Code (IBC) is to provide minimum standards to preserve the public peace, health, and safety by regulating the design, construction, quality of materials, certain equipment, location, grading, use, occupancy, and maintenance of all buildings and structures. IBC standards address foundation design, shear wall strength, and other structurally related conditions.

STATE REGULATIONS

California Building Standards Code

Title 24 of the California Code of Regulations, known as the California Building Standards Code (CBSC) or simply "Title 24," contains the regulations that govern the construction of buildings in California. The CBSC includes 12 parts: California Building Standards Administrative Code, California Building Code, California Residential Building Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Historical Building Code, California Fire Code, California Existing Building Code, California Green Building Standards Code (CAL Green Code), and the California Reference Standards Code. Through the CBSC, the State provides a minimum standard for building design and construction. The CBSC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

California Health and Safety Code

Section 19100 et seq. of the California Health and Safety Code establishes the State's regulations for earthquake protection. This section of the code requires structural designs to be capable of resisting likely stresses produced by phenomena such as strong winds and earthquakes.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 sets forth the policies and criteria of the State Mining and Geology Board, which governs the exercise of governments' responsibilities to prohibit the location of developments and structures for human occupancy across the trace of active faults. The policies and criteria are limited to potential hazards resulting from surface faulting or fault creep within Earthquake Fault Zones, as delineated on maps officially issued by the State Geologist. Working definitions include:

- Fault – a fracture or zone of closely associated fractures along which rocks on one side have been displaced with respect to those on the other side;
- Fault Zone – a zone of related faults, which commonly are braided and sub parallel, but may be branching and divergent. A fault zone has a significant width (with respect to the scale at which the fault is being considered, portrayed, or investigated), ranging from a few feet to several miles;
- Sufficiently Active Fault – a fault that has evidence of Holocene surface displacement along one or more of its segments or branches (last 11,000 years); and

- Well-Defined Fault – a fault whose trace is clearly detectable by a trained geologist as a physical feature at or just below the ground surface. The geologist should be able to locate the fault in the field with sufficient precision and confidence to indicate that the required site-specific investigations would meet with some success.

"Sufficiently Active" and "Well Defined" are the two criteria used by the State to determine if a fault should be zoned under the Alquist-Priolo Act.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically-induced landslides. Under the Act, seismic hazard zones are to be mapped by the State Geologist to assist local governments in land use planning. The program and actions mandated by the Seismic Hazards Mapping Act closely resemble those of the Alquist-Priolo Earthquake Fault Zoning Act (which addresses only surface fault-rupture hazards) and are outlined below:

The State Geologist is required to delineate the various "seismic hazard zones."

- Cities and counties, or other local permitting authority, must regulate certain development "projects" within the zones. They must withhold the development permits for a site within a zone until the geologic and soil conditions of the site are investigated and appropriate mitigation measures, if any, are incorporated into development plans.
- The State Mining and Geology Board provides additional regulations, policies, and criteria to guide cities and counties in their implementation of the law. The Board also provides guidelines for preparation of the Seismic Hazard Zone Maps and for evaluating and mitigating seismic hazards.
- Sellers (and their agents) of real property within a mapped hazard zone must disclose that the property lies within such a zone at the time of sale.

Caltrans Seismic Design Criteria

The California Department of Transportation (Caltrans) has Seismic Design Criteria (SDC), which is an encyclopedia of new and currently practiced seismic design and analysis methodologies for the design of new bridges in California. The SDC adopts a performance-based approach specifying minimum levels of structural system performance, component performance, analysis, and design practices for ordinary standard bridges. The SDC has been developed with input from the Caltrans Offices of Structure Design, Earthquake Engineering and Design Support, and Materials and Foundations. Memo 20-1 Seismic Design Methodology (Caltrans 1999) outlines the bridge category and classification, seismic performance criteria, seismic design philosophy and approach, seismic demands and capacities on structural components, and seismic design practices that collectively make up Caltrans' seismic design.

Division of Mines and Geology

The California Division of Mines and Geology (DMG) operates within the Department of Conservation. The DMG is responsible for assisting in the utilization of mineral deposits and the identification of geological hazards.

State Geological Survey

Similar to the DMG, the California Geological Survey is responsible for assisting in the identification and proper utilization of mineral deposits, as well as the identification of fault locations and other geological hazards.

LOCAL REGULATIONS

City of Lake Forest Municipal Code

The City of Lake Forest Municipal Code includes Chapter 7.04 that requires a soils report if expansive soils or other problem soils are found, prior to a subdivision. Chapter 8.30 requires that a soil engineering and engineering geology report be prepared for grading projects within Lake Forest, unless otherwise waived by the City Engineer.

3.6.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on geology and soils if it will:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42;
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including liquefaction; or
    - Landslides.
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water; or

- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

IMPACTS AND MITIGATION MEASURES

Impact 3.6-1: General Plan implementation has the potential to expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides (Less than Significant)

There are no known active or potentially active faults, or Alquist-Priolo Earthquake Fault Zones, located within the Planning Area. However, there are numerous faults located in the region. Figure 3.6-1 illustrates the location of these faults. These include the Newport-Inglewood Fault, Palos Verdes Fault, Elsinore Fault, Chino Fault, Glen Ivy North Fault, Pelican Hill Fault, and Peralta Hills Fault. Rupture of any of these faults, or of an unknown fault in the region, could cause seismic ground shaking. As a result, future development in the City of Lake Forest may expose people or structures to potential adverse effects associated with a seismic event, including strong ground shaking and seismic-related ground failure.

There are no seismic hazard zones currently mapped in the Planning Area; however, Working Group on California Earthquake Probabilities predicts that the probability that an earthquake will occur in the Los Angeles region within the next 30 years is:

- 60% that an earthquake measuring magnitude 6.7 will occur;
- 46% that an earthquake measuring magnitude 7 will occur;
- 31% that an earthquake measuring magnitude 7.5 will occur.

While there are no known active faults located within the City of Lake Forest, the area could experience considerable ground shaking generated by faults outside Lake Forest. For example, Lake Forest could experience an intensity of MM X generated by seismic events occurring along the Sierra Madre fault. The effect of this intensity level could destroy some building, foundations, and bridges.

Additionally, as noted previously, the State Seismic Hazards Mapping Act (1990) addresses hazards along active faults. The Southern California counties affected by the Program include San Bernardino, Los Angeles, Orange, and Ventura. Seismic hazard zones are currently mapped in Lake Forest, and include areas mapped for liquefaction and earthquake induced landslide hazards. Further, as noted previously, most areas of the City susceptible to seismic-related landslides are located in the higher-elevation portions of the City. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

All projects would be required to comply with the provisions of the CBSC, which requires development projects to: perform geotechnical investigations in accordance with State law,

engineer improvements to address potential seismic and ground failure issues, and use earthquake-resistant construction techniques to address potential earthquake loads when constructing buildings and improvements. As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the CBSC, General Plan, Zoning Ordinance, and other regulations. Subsequent development and infrastructure would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. In addition to the requirements associated with the CBSC and the Municipal Code, the General Plan includes policies and actions to address potential impacts associated with seismic activity.

The General Plan policies and actions (listed below) require review of development proposals to ensure compliance with California Health and Safety Code Section 19100 et seq. (Earthquake Protection Law), which requires that buildings be designed to resist stresses produced by natural forces such as earthquakes and wind. Policy PS-1.7 requires new critical infrastructure and facilities that may be built in the City to incorporate site specific seismic structural design as required by applicable building codes. All development and construction proposals must be reviewed by the City to ensure conformance with applicable building standards. Development on soils sensitive to seismic activity is only allowed after adequate site analysis, including appropriate siting, design of structure, and foundation integrity. Policy PS-1.4 requires assessment and mitigation of hazards related to liquefaction, landslides, and flooding for new development projects or City improvement projects that are identified by the City as susceptible to these hazards. All future projects are subject to CEQA review to address seismic safety issues and provide adequate mitigation for existing and potential hazards identified. With the implementation of the policies and actions in the General Plan, as well as applicable State and City codes, potential impacts associated with a seismic event, including rupture of an earthquake fault, seismic ground shaking, liquefaction, and landslides would be **less than significant**.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-1.1: Geologic Hazard Identification. Maintain the City's geologic and seismic hazards map in concert with updates from the California Geologic Survey and local surveys and update as appropriate.

PS-1.2: Earthquake Protection. Enforce State seismic design guidelines and all relevant building codes to reduce the risk of damage associated with seismic activity.

PS-1.3: Liquefaction. Require special site-specific studies in areas potentially subject to liquefaction (shown in Figure 9-5 of the General Plan Existing Conditions Report) to determine the nature and extent of possible liquefaction and to identify engineering and development siting measures to permit development to occur.

PS-1.4: Development. Require assessment and mitigation of hazards related to liquefaction, landslides, and flooding for new development projects or City improvement projects that are identified by the City as susceptible to these hazards.

PS-1.5: Risk Inventories. Develop inventories of at-risk public buildings and infrastructure within the City of Lake Forest and evaluate potential mitigation projects to address risks, as financially feasible.

PS-1.6: Critical Facilities. Require new critical infrastructure and facilities that may be built in the City to incorporate site specific seismic structural design as required by applicable building codes.

PS-1.7: Public Education. Educate the public through programs and outreach materials on natural threats pertaining to Lake Forest and best practices for reducing damage and personal harm.

ACTIONS

PS-1a. Review development proposals to ensure compliance with California Health and Safety Code Section 19100 et seq. (Earthquake Protection Law), which requires that buildings be designed to resist stresses produced by natural forces such as earthquakes and wind.

Impact 3.6-2: General Plan implementation has the potential to result in substantial soil erosion or the loss of topsoil (Less than Significant)

The General Plan would allow development and improvement projects that would involve some land clearing, mass grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of a substantial amount of nonrenewable topsoil and could adversely affect water quality in nearby surface waters. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

As noted previously, soil erosion data for the City of Lake Forest was obtained from the NRCS. As identified by the NRCR web soil survey, the erosion factor K within the City of Lake Forest varies widely. The NRCS does not provide erosion factors for the urban land soils in the City, however, the erosion potential for the urban land soils in the City is considered to be low.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the CBSC, General Plan, Zoning Ordinance, and other regulations. In addition to compliance with City standards and policies, the Regional Water Quality Control Board will require a project specific Storm Water Pollution Prevention Plan (SWPPP) to be prepared for each project that disturbs an area of one acre or larger. The SWPPPs will include project specific best management measures that are designed to control drainage and erosion. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA.

The General Plan includes a range of policies and one action related to best management practices, NPDES requirements, and minimizing discharge of materials (including eroded soils) into the storm drain system. With the implementation of the policies and actions in the General Plan, as well as applicable State and City requirements, potential impacts associated with erosion and loss of topsoil would be **less than significant**.

GENERAL PLAN POLICIES AND ACTION THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PF-5.1: Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

ACTION

PF-5a: Continue to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased beyond predevelopment levels during rain and flood events.

Impact 3.6-3: General Plan implementation has the potential to result in development located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse (Less than Significant)

Development allowed under the General Plan could result in the exposure of people and structures to conditions that have the potential for adverse effects associated with ground instability or failure. Soils and geologic conditions in the Lake Forest Planning Area have the potential for landslides, lateral spreading, subsidence, liquefaction, or collapse. Each are discussed below:

Landslide: Figure 3.6-6 illustrates the landslide potential (for non-seismically induced potential) in the vicinity of the City of Lake Forest. The landslide potential is relatively low in the southwestern portion of the City, where elevation change is relatively low. However, the landslide potential increases in the central and northern portions of the City, which contains areas with increased elevation change.

Lateral Spreading: Lateral spreading generally is a phenomenon where blocks of intact, non-liquefied soil move down slope on a liquefied substrate of large areal extent. The potential for lateral spreading is present where open banks and unsupported cut slopes provide a free face (unsupported vertical slope face). Ground shaking, especially when inducing liquefaction, may cause lateral spreading toward unsupported slopes. The greatest potential for lateral spreading in the Planning Area is in the hilly terrain to the east.

Subsidence: Drainage sufficient to create subsidence is uncommon within the City of Lake Forest, and subsidence in the Planning Area has not been considered a significant issue.

Liquefaction: Figure 3.6-2 shows liquefaction seismic hazard zones mapped within the City of Lake Forest, which delineates areas where liquefaction may occur during a strong earthquake. Areas along existing waterways, such as Borrego Canyon Wash, Serrano Creek, and Aliso Creek, are defined as having the greatest potential for liquefaction.

Collapse: Collapsible soils undergo a rearrangement of their grains and a loss of cementation, resulting in substantial and rapid settlement under relatively low loads. Collapsible soils occur predominantly at the base of mountain ranges, where Holocene-age alluvial fan and wash sediments have been deposited during rapid run-off events. Differential settlement of structures typically occurs when heavily irrigated landscape areas are near a building foundation. Examples of common problems associated with collapsible soils include tilting floors, cracking or separation in structures, sagging floors, and nonfunctional windows and doors. Existing alluvium within the City of Lake Forest may be susceptible to collapse and excessive settlements, which could create the risk of hydroconsolidation if these soils were exposed to excessive moisture

Conclusion: This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below. As future development and infrastructure projects are considered by the City of Lake Forest, each project will be evaluated for conformance with the CBSC, the General Plan, Zoning Ordinance, and other regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. Future development and improvement projects would be required to have a specific geotechnical study prepared and incorporated into the improvement design, consistent with the requirements of the State and City codes. In addition to the requirements associated with the CBSC and the Municipal Code, the General Plan includes policies and actions to ensure that development projects address potential geologic hazards, at-risk buildings and infrastructure is evaluated for potential risks, and site-specific studies are completed for area subject to liquefaction. With the implementation of the policies and actions in the General Plan, as well as applicable State and City codes, potential impacts associated with ground instability or failure would be **less than significant**.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-1.1: Geologic Hazard Identification. Maintain the City's geologic and seismic hazards map in concert with updates from the California Geologic Survey and local surveys and update as appropriate.

PS-1.3: Liquefaction. Require special site-specific studies in areas potentially subject to liquefaction (shown in Figure 9-5 of the General Plan Existing Conditions Report) to determine the nature and extent of possible liquefaction and to identify engineering and development siting measures to permit development to occur.

PS-1.4: Development. Require assessment and mitigation of hazards related to liquefaction, landslides, and flooding for new development projects or City improvement projects that are identified by the City as susceptible to these hazards.

PS-1.5: Risk Inventories. Develop inventories of at-risk public buildings and infrastructure within the City of Lake Forest and evaluate potential mitigation projects to address risks, as financially feasible.

PS-1.7: Public Education. Educate the public through programs and outreach materials on natural threats pertaining to Lake Forest and best practices for reducing damage and personal harm.

ACTIONS

PS-1a. Review development proposals to ensure compliance with California Health and Safety Code Section 19100 et seq. (Earthquake Protection Law), which requires that buildings be designed to resist stresses produced by natural forces such as earthquakes and wind.

Impact 3.6-4: General Plan implementation has the potential to result in development on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property (Less than Significant)

Expansive soil properties can cause substantial damage to building foundations, piles, pavements, underground utilities, and/or other improvements. Structural damage, such as warping and cracking of improvements, and rupture of underground utility lines, may occur if the expansive potential of soils is not considered during the design and construction of all improvements.

Linear extensibility is a method for measuring expansion potential. The expansion potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

The linear extensibility of the soils within Lake Forest ranges from Low to Very High. Figure 3.6-5 illustrates the shrink-swell potential of soils in the City of Lake Forest. The majority of the City of Lake Forest has low potential for expansive soils, including most of the developed land. The areas with moderate to high expansive soils represent only a small portion of the City of Lake Forest, and would require special design considerations due to shrink-swell potentials. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the CBSC, General Plan, Zoning Ordinance, and other applicable regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA.

The Public Safety Element of the General Plan establishes policies that are designed to protect from geologic hazards, including expansive soils. Consistency with the General Plan policies will require identification of geologic hazards and risk inventory of existing at-risk buildings and infrastructure. As required by the CBSC, a site-specific geotechnical investigation will identify the potential for damage related to expansive soils and non-uniformly compacted fill and engineered fill. If a risk is identified, design criteria and specification options may include removal of the problematic soils, and replacement, as needed, with properly conditioned and compacted fill material that is designed to withstand the forces exerted during the expected shrink-swell cycles and settlements.

Design criteria and specifications set forth in the design-level geotechnical investigation will ensure impacts from problematic soils are minimized. There are no additional significant adverse environmental impacts, apart from those disclosed in the relevant chapters of this Draft EIR, that are anticipated to occur associated with expansive soils. Therefore, this impact is considered **less than significant**.

GENERAL PLAN POLICIES THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-1.1: Geologic Hazard Identification. Maintain the City's geologic and seismic hazards map in concert with updates from the California Geologic Survey and local surveys and update as appropriate.

PS-1.5: Risk Inventories. Develop inventories of at-risk public buildings and infrastructure within the City of Lake Forest and evaluate potential mitigation projects to address risks, as financially feasible.

PS-1.7: Public Education. Educate the public through programs and outreach materials on natural threats pertaining to Lake Forest and best practices for reducing damage and personal harm.

Impact 3.6-5: General Plan implementation does not have the potential to have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water (Less than Significant)

As with the water system, the City's sewer services are provided by three utility districts, Irvine Ranch Water District (IRWD), El Toro Water District (ETWD), and Trabuco Canyon Water District (TCWD). Among the three agencies, there are approximately 215 miles of sewer main within the borders of Lake Forest.

Wastewater flow originating within Lake Forest northeast of Highway 241 flows across the IRWD collection system to the Michelson Water Recycling Plant. All other flow originating in Lake Forest

is directed to the Los Alisos Water Recycling Plant (LAWRP). Recycled water is produced at both plants, and recycled water makes up about 20 percent of IRWD's current water supply.

The majority of the flow in the City's ETWD area is conveyed by gravity and eventually flows across the I-5 highway via an 18-inch trunk main southwest into Laguna Woods where the ETWD Water Recycling Plant (WRP) is located. Flow originating from the community located just south of Ralph A. Gates Elementary School flows across the I-5 highway and into Laguna Woods south of the 18-inch trunk main. The flow then is directed to the Aliso Viejo Pump Station where it is pumped to the ETWD WRP. Wastewater from a few small residential streets at the far south end of the City flows southeast into Mission Viejo to Freeway Lift Station where it joins flow from Mission Viejo and is pumped to the ETWD collection system west of the I-5 highway.

Residents who live in part of the Portola Hills community in the northeast section of the City are serviced by TCWD. Flow from this community is directed into the El Toro Road Sewage Collection System, which is jointly-owned by TCWD, IRWD, and Santa Margarita Water District (SMWD). All flow from the El Toro Road Sewage Collection System is pumped into SMWD's wastewater collection system and is eventually treated at the Chiquita Water Reclamation Plant then disposed of.

All new wastewater generated from General Plan land uses will be collected and transmitted to the Michelson Water Recycling Plant, LAWRP, ETWD WRP, or Chiquita Water Reclamation Plant for treatment. There will be no septic tanks or alternative waste water disposal systems utilized for new development planned under the General Plan. Therefore, this impact is considered **less than significant** and no mitigation is required.

Impact 3.6-6: General Plan implementation has the potential to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (Less than Significant)

DEFINITION OF SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;

5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.
6. All identifiable vertebrate fossils are considered significant due to the rarity of their preservation.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and invertebrate animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important.

PALEONTOLOGICAL SENSITIVITY FOR PLANNING AREA

The following section is based on the Paleontological and Cultural Resources Assessment that was completed for the General Plan Update (Cogstone Resource Management Inc., 2018).

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to a study area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria.

Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to five millimeters in diameter or less. Moreover, fossil preservation also greatly increases after natural burial in rivers, lakes, or oceans. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. Therefore, the sands, silts, and clays of rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

No formations in the Planning Area are assigned a very high sensitivity. The following formations are assigned a high sensitivity: late Eocene to early Miocene Vaqueros, Vaqueros-Sespe, and Sespe formations; the late Miocene Monterey Formation; the late Miocene La Vida Member of the Puente Formation; and the late Miocene to early Pliocene Capistrano Formation. Formations assigned a moderate but patchy sensitivity include the Paleocene Santiago Formation, the middle Miocene Topanga Group, the Pliocene Niguel Formation, the early to middle Pleistocene very old axial-channel deposits, and the Pleistocene sections of the young axial-channel deposits. No formations are assigned a potential but not determined sensitivity. Formations assigned a low sensitivity include the Paleocene Silverado Formation, the late Miocene Puente Formation (exclusive of the La Vida Member), Pleistocene and Holocene alluvial fan and landslide deposits, and all Holocene deposits exclusive of the modern artificial fill. Only the modern artificial fill is assigned a very low sensitivity. The paleontological sensitivity of the Planning Area is shown in Figure 3.6-7.

CONCLUSION

It is possible that undiscovered paleontological resources could be encountered during ground-disturbing activities. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below. Damage to or destruction of a paleontological resource would be considered a potentially significant impact under local, state, or federal criteria. Implementation of the proposed General Plan actions would ensure steps would be taken to reduce impacts to paleontological resources in the event that they are discovered during construction. This mitigation measure would reduce this impact to a ***less-than-significant*** level.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-3.1 Preservation. Protect areas of important historic, archaeological, and paleontologic resources.

RR-3.3 Development. Ensure that human remains are treated with sensitivity and dignity, and ensure compliance with the provisions of California Health and Safety Code Section 7050.5 and California Public Resources Code Section 5097.98.

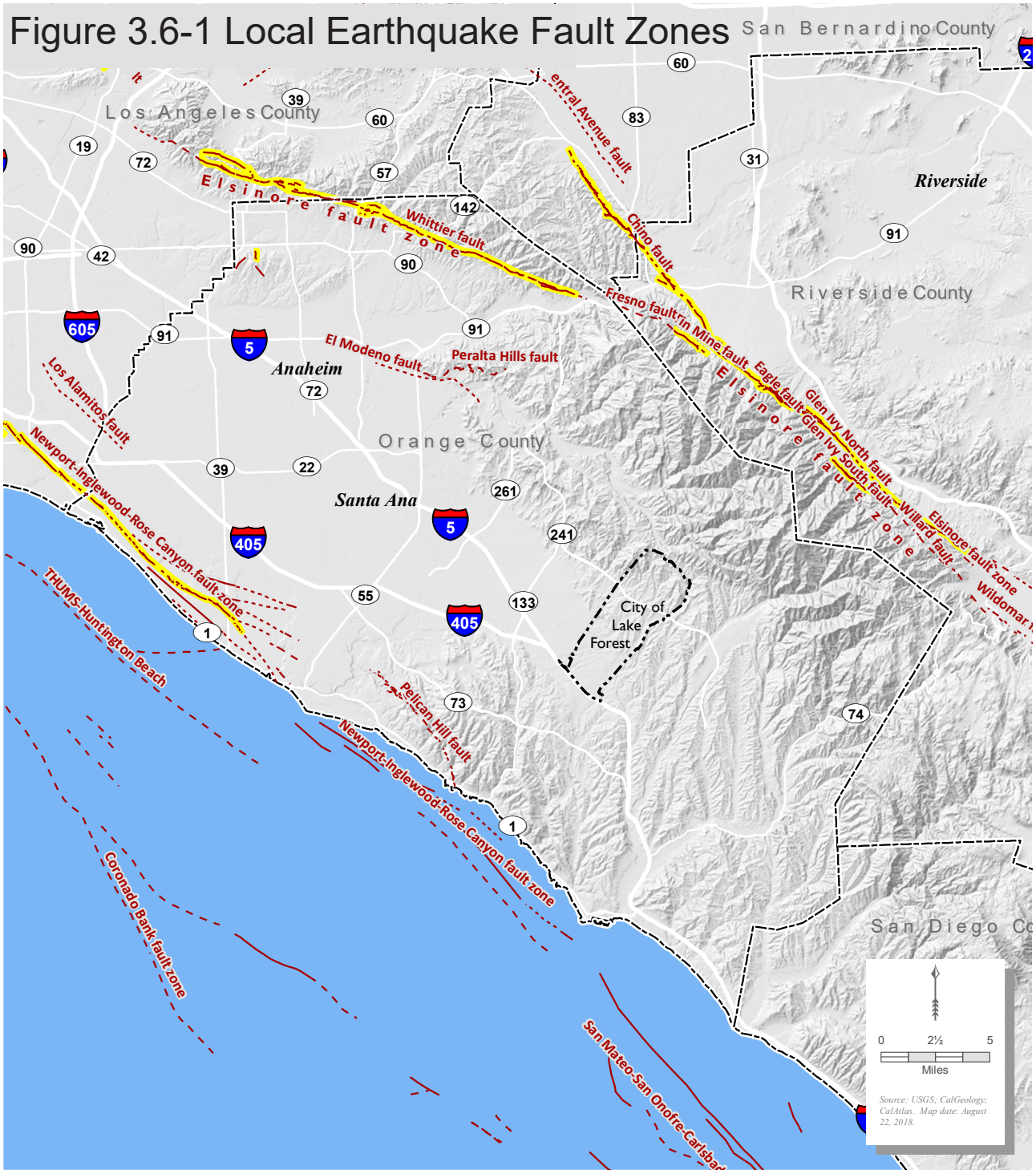
ACTIONS

RR-3d: Require all development, infrastructure, and other ground-disturbing projects to comply with the following conditions in the event of an inadvertent discovery of a paleontological resource:

- *If construction or grading activities result in the discovery of significant prehistoric archaeological artifacts or unique paleontological resources, all work within 100 feet of the discovery shall cease, the Director of Community Development shall be notified, the resources shall be examined by a qualified archaeologist, paleontologist, or historian for appropriate protection and preservation measures; and work may only resume when*

appropriate protections are in place and have been approved by the Director of Community Development.

Figure 3.6-1 Local Earthquake Fault Zones



Legend

Alquist-Priolo Fault Zones

Quaternary Faults

Well-constrained

Moderately-constrained

Inferred

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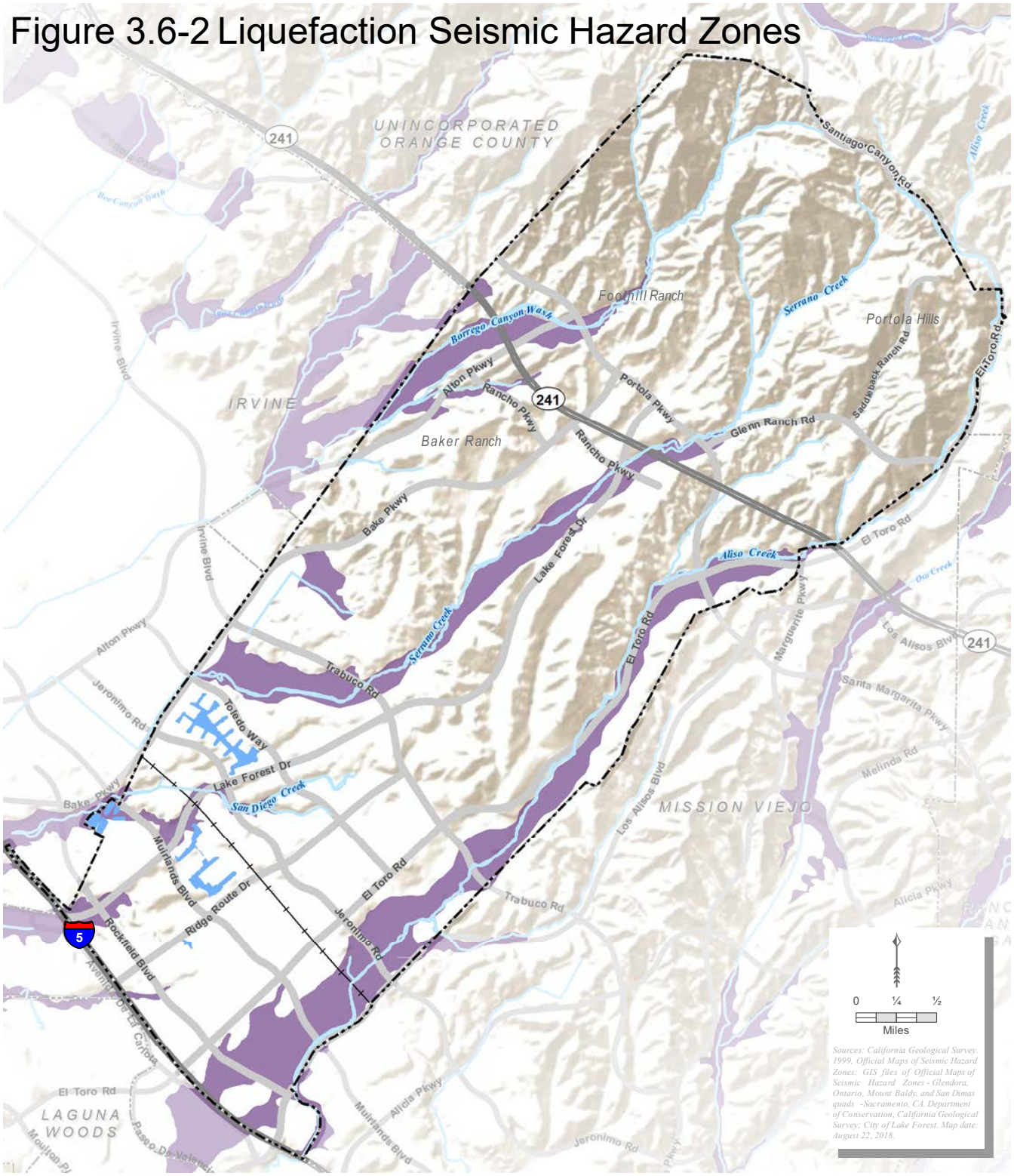
Figure 3.6-2 Liquefaction Seismic Hazard Zones



Legend

- City of Lake Forest
- Area where Liquefaction may occur during a Strong Earthquake

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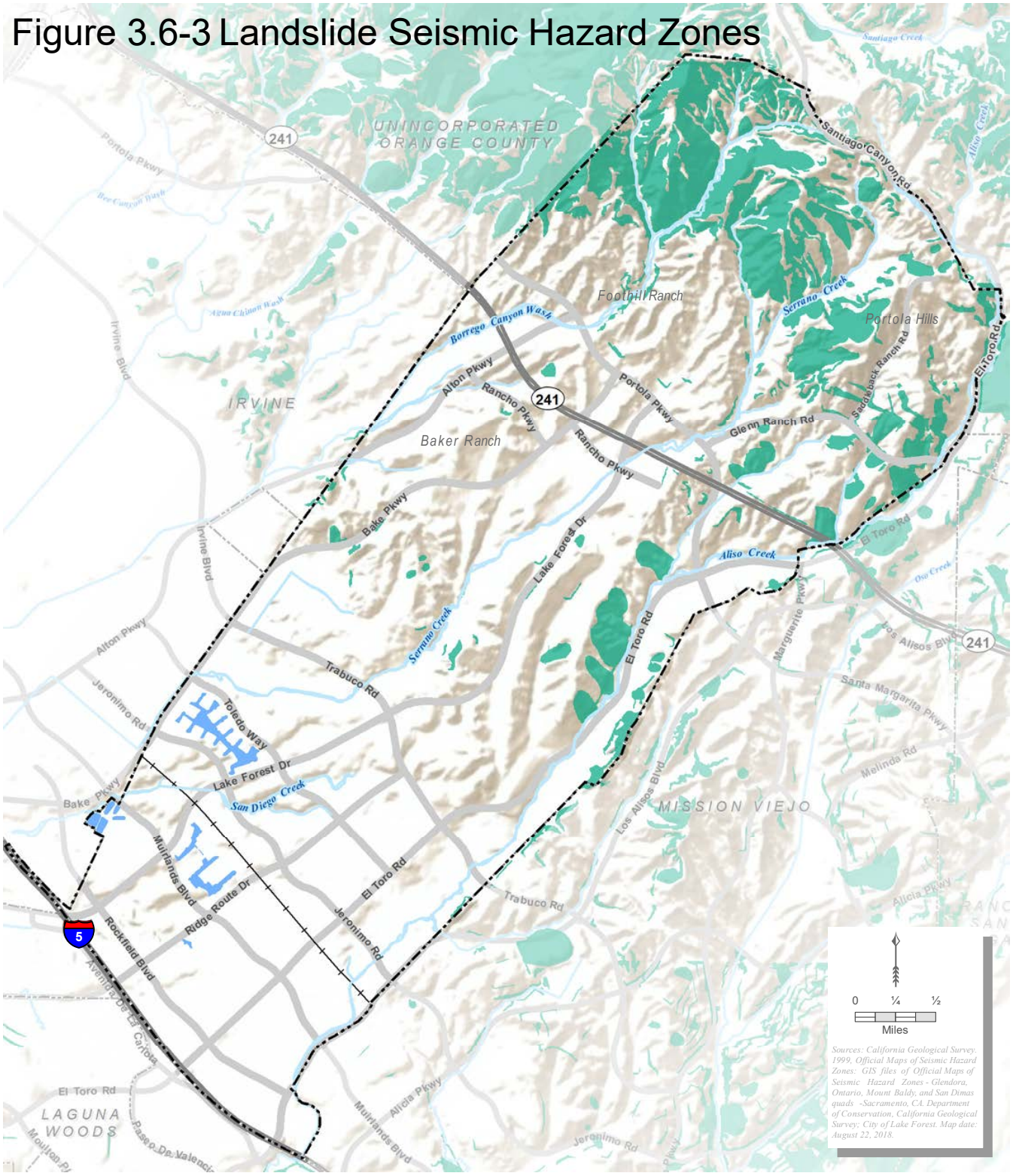
Figure 3.6-3 Landslide Seismic Hazard Zones



Legend

- City of Lake Forest
- Area where Landslide may occur during a Strong Earthquake

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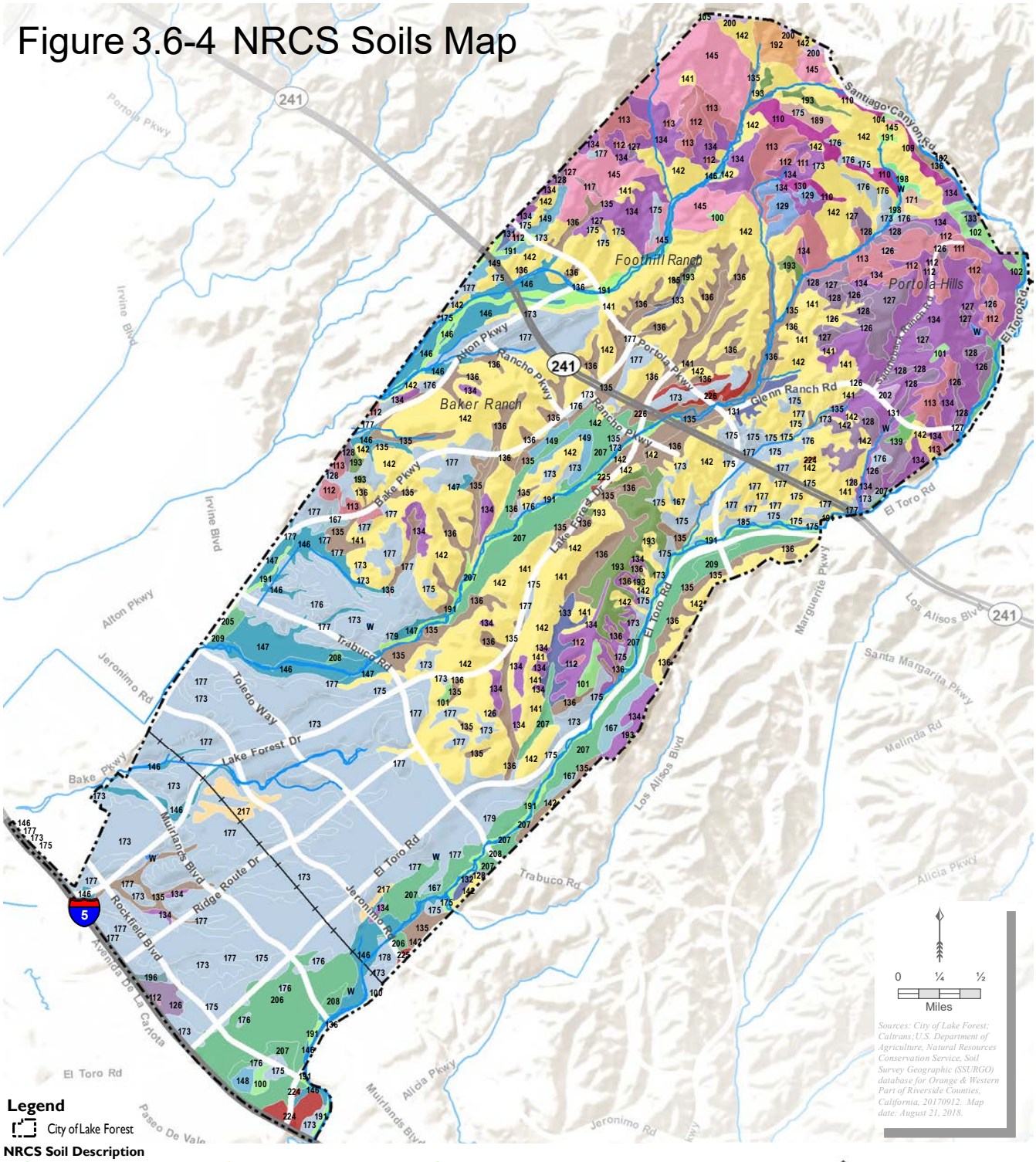
Figure 3.6-4 NRCS Soils Map



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NRCS Soil Description

- Alo clay/clay variant (100-105)
- Anaheim clay loam (109-110)
- Balcom clay loam (111-113)
- Blasingame stony loam (117)
- Bosanko clay (126-128)
- Bosanko-Balcom complex (129-130)
- Botella loam/clay loam (131-133)
- Calleguas clay loam (134)
- Capistrano sandy loam (135-136)
- Chino silty clay loam (139)
- Cieneba sandy loam (141-142)
- Cieneba-Rock outcrop complex (145)
- Corralitos loamy sand (146-147)
- Cropley clay (148-149)
- Metz loamy sand (163)
- Mocho loam (167)
- Modjeska gravelly loam (171)
- Myford sandy loam (173-179)
- Pits (185)
- Rincon clay loam (189)
- Riverwash (191)
- Rock outcrop-Cieneba complex (192)
- San Andreas sandy loam (193)
- San Emigdio fine sandy loam (195-196)
- Soboba cobbly loam sand (198)
- Soper loam/gravelly loam (199-202)
- Sorrento loam/clay loam/sandy loam (205-209)
- Water (W)
- Xeralfic arents, loamy (217)
- Yorba cobbly/gravelly sand loam (224-226)

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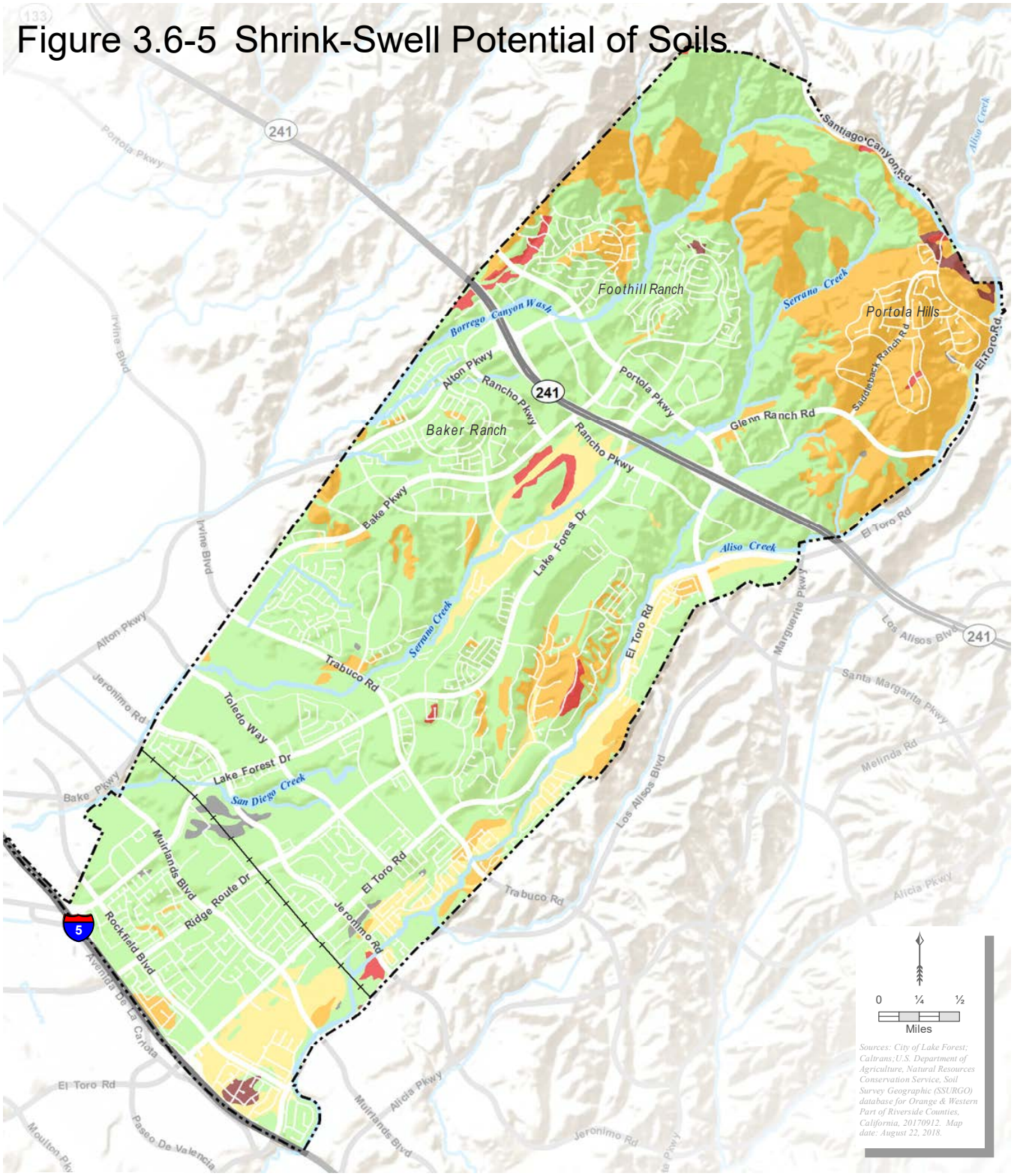
Figure 3.6-5 Shrink-Swell Potential of Soils



Legend

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Shrink-Swell Potential* of Surface Horizon

- N/A
- Low Potential
- Low to Moderate
- Moderate
- High
- High to Very High

*Shrink-Swell Potential is determined by linear extensibility. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Soils are considered to have low potential when the linear extensibility is less than 3%, moderate if 3-6%, high if 6-9%, and very high if greater than 9%.

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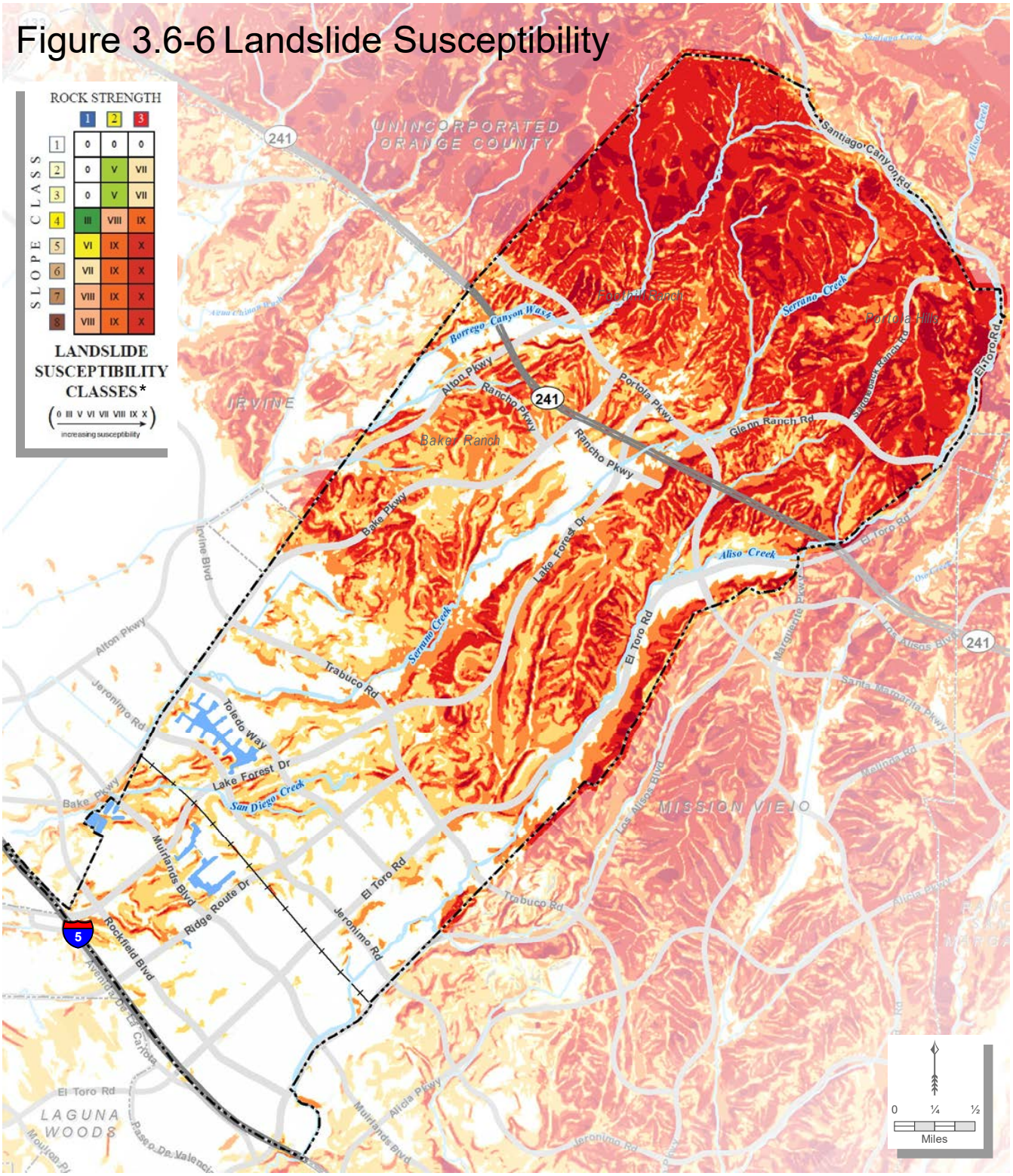
Figure 3.6-6 Landslide Susceptibility



Legend

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** Rock Strength and slope are combined to create classes of landslide susceptibility. These classes express the generalization that on very low slopes, landslide susceptibility is low even in weak materials, and that landslide susceptibility increases with slope and in weaker rocks. Very high landslide susceptibility, classes VIII, IX, and X, includes very steep slopes in hard rocks and moderate to very steep slopes in weak rocks. Source: "Susceptibility to Deep-Seated Landslides in California, 2011, Map sheet 58, California Geological Survey. Map date: August 22, 2018.*

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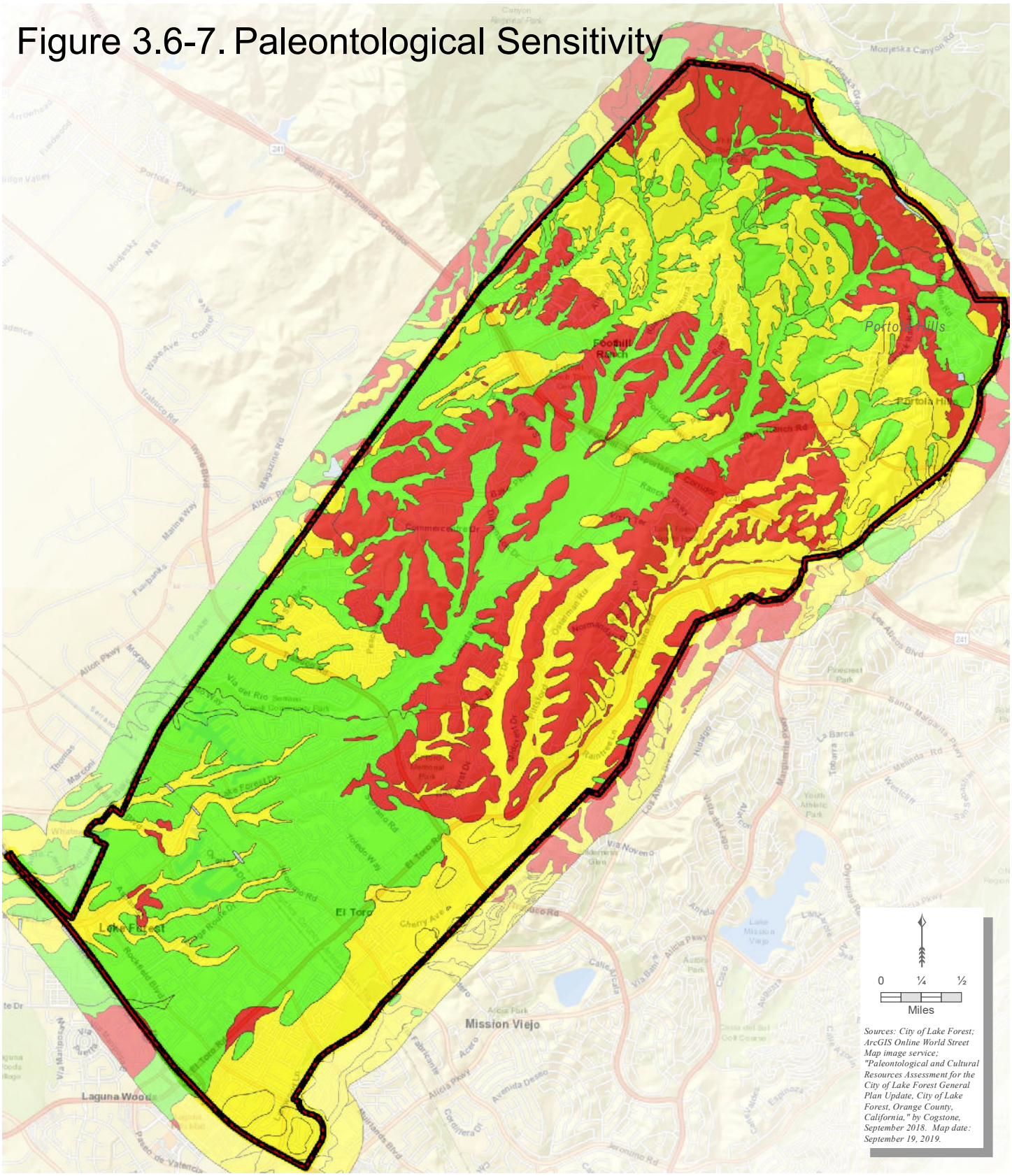
Figure 3.6-7. Paleontological Sensitivity



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Paleontological Sensitivity

- High
- Moderate but Patchy
- Low
- None

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This section discusses regional greenhouse gas (GHG) emissions, climate change, and energy conservation impacts that could result from implementation of the General Plan. This section provides a background discussion of greenhouse gases and climate change linkages and effects of global climate change. This section also provides background discussion on energy use in Lake Forest. This section is organized with an existing setting, regulatory setting, approach/methodology, and impact analysis.

The analysis and discussion of the GHG, climate change, and energy conservation impacts in this section focuses on the General Plan's consistency with local, regional, statewide, and federal climate change and energy conservation planning efforts and discusses the context of these planning efforts as they relate to the proposed project. Disclosures of the estimated energy usage and greenhouse gas emissions due to implementation of the General Plan are provided.

Emissions of GHGs have the potential to adversely affect the environment in a cumulative context. The emissions from a single project will not cause global climate change; however, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change. Therefore, the analysis of GHGs and climate change presented in this section is presented in terms of the proposed project's contribution to cumulative impacts and potential to result in cumulatively considerable impacts related to GHGs and climate change.

No comments were received during the NOP comment period regarding this environmental topic.

3.7.1 ENVIRONMENTAL SETTING

GREENHOUSE GASES AND CLIMATE CHANGE LINKAGES

Various gases in the Earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring greenhouse gases include water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, solely a product of industrial activities. Although the direct greenhouse gases CO_2, CH_4, and N_2O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2011, concentrations of these three greenhouse gases have increased globally by 40, 150, and 20 percent, respectively (IPCC, 2013).

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are CO_2, CH_4, O_3, water vapor, N_2O, and chlorofluorocarbons (CFCs).

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. In California, the transportation sector is the largest emitter of GHGs, followed by the industrial sector (California Energy Commission, 2019b).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California produced approximately 424 million gross metric tons of carbon dioxide equivalents ($MMTCO_2e$) in 2017 (California Energy Commission, 2019b). To meet the annual statewide targets set by the California Air Resources Board, California emissions need to be below 431 $MMTCO_2e$ by 2020, and to below 260 $MMTCO_2e$ by 2030 (California Air Resources Board, 2017).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2017, accounting for 41% of total GHG emissions in the state. This category was followed by the industrial sector (24%), the electricity generation sector (including both in-state and out of-state sources) (15%), the agriculture and forestry sector (8%), the residential energy consumption sector (7%), and the commercial energy consumption sector (5%) (California Energy Commission, 2019b).

EFFECTS OF GLOBAL CLIMATE CHANGE

The effects of increasing global temperature are far-reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs are anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. The snowpack portion of the supply could potentially decline by 50% to 75% by the end of the 21st century (National Resources Defense Council, 2014). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased

precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels (California Environmental Protection Agency, 2010). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands. As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. According to the most recent California Climate Change Assessment (*California's Fourth Climate Change Assessment*) (2019), the impacts of global warming in California are anticipated to include, but are not limited to, the following.

Wildfires

In recent years, the area burned by wildfires has increased in parallel with increasing air temperatures. Wildfires have also been occurring at higher elevations in the Sierra Nevada mountains, a trend which is expected to continue under future climate change. Climate change will likely modify the vegetation in California, affecting the characteristics of fires on the land. Land use and development patterns also play an important role in future fire activity. Because of these complexities, projecting future wildfires is complicated, and results depend on the time period for the projection and what interacting factors are included in the analysis. Because wildfires are affected by multiple and sometimes complex drivers, projections of wildfire in future decades in California range from modest changes from historical conditions to relatively large increases in wildfire regimes.

Public Health

Nineteen heat-related events occurred from 1999 to 2009 that had significant impacts on human health, resulting in about 11,000 excess hospitalizations. However, the National Weather Service issued Heat Advisories for only six of the events. Heat-Health Events (HHEs), which better predict risk to populations vulnerable to heat, will worsen drastically throughout the state: for example, by midcentury, the Central Valley is projected to experience average Heat-Health Events that are two weeks longer, and HHEs could occur four to ten times more often in the Northern Sierra region.

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. Climate change poses direct and indirect risks to public health, as people will experience earlier death and worsening illnesses. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions.

Energy Resources

Higher temperatures will increase annual electricity demand for homes, driven mainly by the increased use of air conditioning units. High demand is projected in inland and Southern California, and more moderate increases are projected in cooler coastal areas. However, the increased annual residential energy demand for electricity is expected to be offset by reduced use of natural gas for

space heating. Increases in peak hourly demand during the hot months of the year could be more pronounced than changes in annual demand. This is a critical finding for California's electric system, because generating capacity must match peak electricity demand.

Water Supply

A vast network of man-made reservoirs and aqueducts capture and transport water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The state's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major state fresh water supply.

Current management practices for water supply and flood management in California may need to be revised for a changing climate. This is in part because such practices were designed for historical climatic conditions, which are changing and will continue to change during the rest of this century and beyond. As one example, the reduction in the Sierra Nevada snowpack, which provides natural water storage, will have implications throughout California's water management system. Even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

Agriculture

Increased GHG emissions are expected to cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

Crop growth and development will be affected, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant

populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Climate change will make forests more susceptible to extreme wildfires. *California's Fourth Climate Change Assessment* found that by 2100, if greenhouse gas emissions continue to rise, the frequency of extreme wildfires burning over approximately 25,000 acres would increase by nearly 50 percent, and that average area burned statewide would increase by 77 percent by the end of the century. In the areas that have the highest fire risk, wildfire insurance is estimated to see costs rise by 18 percent by 2055 and the fraction of property insured would decrease.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the state. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60% to 80% by the end of the century as a result of increasing temperatures. The productivity of the state's forests is also expected to decrease as a result of global warming.

Rising Sea Levels

A new model estimates that, under mid to high sea-level rise scenarios, 31 to 67 percent of Southern California beaches may completely erode by 2100 without large-scale human interventions. Statewide damages could reach nearly $17.9 billion from inundation of residential and commercial buildings under 50 centimeters (~20 inches) of sea-level rise, which is close to the 95th percentile of potential sea-level rise by the middle of this century. A 100-year coastal flood, on top of this level of sea-level rise, would almost double the costs.

Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the state's coastal regions. Rising sea levels would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

ENERGY CONSUMPTION

Energy in California is consumed from a wide variety of sources. Fossil fuels (including gasoline and diesel fuel, natural gas, and energy used to generate electricity) are most widely used form of energy in the State. However, renewable source of energy (such as solar and wind) are growing in proportion to California's overall energy mix. A large driver of renewable sources of energy in California is the State's current Renewable Portfolio Standard (RPS), which requires the State to derive at least 33% of electricity generated from renewable resources by 2020, and 50 percent by 2030.

Overall, in 2017, California's per capita energy usage was ranked 48th in the nation (U.S. EIA, 2018). Additionally, California's per capita rate of energy usage has remained relatively constant since the 1970's. Many State regulations since the 1970's, including new building energy efficiency

standards, vehicle fleet efficiency measures, as well as growing public awareness, have helped to keep per capita energy usage in the State in check.

The consumption of nonrenewable energy (primarily gasoline and diesel fuel) associated with the operation of passenger, public transit, and commercial vehicles results in GHG emissions that ultimately result in global climate change. Other fuels such as natural gas, ethanol, and electricity (unless derived from solar, wind, nuclear, or other energy sources that do not produce carbon emissions) also result in GHG emissions and contribute to global climate change.

Electricity Consumption

California relies on a regional power system composed of a diverse mix of natural gas, renewable, hydroelectric, and nuclear generation resources. Approximately 71 percent of the electrical power needed to meet California's demand is produced in the state. Approximately 29 percent of its electricity is imported from the Pacific Northwest and the Southwest (California Energy Commission, 2019b). In 2010, California's in-state generated electricity was derived from natural gas (53.4 percent), large hydroelectric resources (14.6 percent), coal (1.7 percent), nuclear sources (15.7 percent), and renewable resources that include geothermal, biomass, small hydroelectric resources, wind, and solar (14.6 percent) (California Energy Commission, 2019b). The percentage of renewable resources as a proportion of California's overall energy portfolio is increasing over time, as directed the State's Renewable Portfolio Standard (RPS).

According to the California Energy Commission (CEC), total statewide electricity consumption increased from 166,979 gigawatt-hours (GWh) in 1980 to 228,038 GWh in 1990, which is an estimated annual growth rate of 3.76 percent. The statewide electricity consumption in 1997 was 246,225 GWh, reflecting an annual growth rate of 1.14 percent between 1990 and 1997 (California Energy Commission, 2019b). Statewide consumption was 274,985 GWh in 2010, an annual growth rate of 0.9 percent between 1997 and 2010. The community of Lake Forest consumed approximately 184,540 MWh in 2017 (according to Southern California Edison), roughly 0.1% of the state total.

Oil

The primary energy source for the United States is oil, which is refined to produce fuels like gasoline, diesel, and jet fuel. Oil is a finite, nonrenewable energy source. World consumption of petroleum products has grown steadily in the last several decades. As of 2018, world consumption of oil had reached 100 million barrels per day (U.S. EIA, 2019a). The United States, with approximately five percent of the world's population, accounts for approximately 21 percent of world oil consumption, or approximately 20.5 million barrels per day (U.S. EIA, 2019b). The transportation sector relies heavily on oil. In California, petroleum-based fuels currently provide approximately 96 percent of the state's transportation energy needs (California Energy Commission, 2018).

Natural Gas

Natural gas supplies are derived from underground sources and brought to the surface at gas wells. Once it is extracted, gas is purified and the odorant that allows gas leaks to be detected is added to the normally odorless gas. Natural gas suppliers, such as Southern California Gas Company, then send the gas into transmission pipelines, which are usually buried underground. Compressors propel the gas through the pipeline system, which delivers it to homes and businesses.

The state produces approximately 12 percent of its natural gas, while obtaining 22 percent from Canada and 65 percent from the Rockies and the Southwest (California Energy Commission, 2018). In 2006, California produced 325.6 billion cubic feet of natural gas (California Energy Commission, 2019a). Southern California Edison (SCE) provides natural gas for residential, industrial, and agency consumers within Orange County, including the City of Lake Forest

3.7.2 REGULATORY SETTING

FEDERAL

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: National ambient air quality standards (NAAQS) for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The U.S. Environmental Protection Agency (USEPA) is responsible for administering the FCAA. The FCAA requires the USEPA to set NAAQS for several problem air pollutants based on human health and welfare criteria. Two types of NAAQS were established: primary standards, which protect public health, and secondary standards, which protect the public welfare from non-health-related adverse effects such as visibility reduction.

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy

standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the USEPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The USEPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

Energy Policy Act of 1992 (EPAct)

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

Energy Policy Act of 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Intermodal Surface Transportation Efficiency Act (ISTEA)

ISTEA (49 U.S.C. § 101 et seq.) promoted the development of intermodal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that metropolitan planning organizations (MPOs), were to address in developing transportation plans and programs, including some energy-related factors. To meet the ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values that were to guide transportation decisions in that metropolitan area. The planning process was then to address these policies. Another requirement was to consider the consistency of transportation planning with federal, state, and local energy goals. Through this requirement, energy consumption was expected to become a criterion, along with cost and other values that determine the best transportation solution.

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)

SAFETEA-LU (23 U.S.C. § 507), renewed the Transportation Equity Act for the 21st Century (TEA-21) of 1998 (23 U.S.C.; 49 U.S.C.) through FY 2009. SAFETEA-LU authorized the federal surface transportation programs for highways, highway safety, and transit. SAFETEA-LU addressed the many challenges facing our transportation system today—such as improving safety, reducing

traffic congestion, improving efficiency in freight movement, increasing intermodal connectivity, and protecting the environment—as well as laying the groundwork for addressing future challenges. SAFETEA-LU promoted more efficient and effective federal surface transportation programs by focusing on transportation issues of national significance, while giving state and local transportation decision makers more flexibility to solve transportation problems in their communities. SAFETEA-LU was extended in March of 2010 for nine months, and expired in December of the same year. In June 2012, SAFETEA-LU was replaced by the Moving Ahead for Progress in the 21st Century Act (MAP-21), which took effect October 1, 2012.

U.S. Federal Climate Change Policy

According to the USEPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science." The federal government's goal is to reduce the greenhouse gas (GHG) intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including "ENERGY STAR", "Climate Leaders", and Methane Voluntary Programs. However, as of this writing, there are no adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG emissions sources in the United States. In general, this national reporting requirement will provide USEPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO_2 per year. This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85% of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule.

STATE

Warren-Alquist Act

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as CEC. The Act established state policy to reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures. The California Public Utilities Commission (CPUC) regulates privately-owned utilities in the energy, rail, telecommunications, and water fields.

Energy Action Plan

The first Energy Action Plan (EAP) emerged in 2003 from a crisis atmosphere in California's energy markets. The State's three major energy policy agencies (CEC, CPUC, and the Consumer Power and Conservation Financing Authority [established under deregulation and now defunct]) came together to develop one high-level, coherent approach to meeting California's electricity and natural gas needs. It was the first time that energy policy agencies formally collaborated to define a common vision and set of strategies to address California's future energy needs and emphasize the importance of the impacts of energy policy on the California environment.

In the October 2005 Energy Action Plan II, CEC and CPUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original EAP, such as the emerging importance of climate change, transportation-related energy issues, and research and development activities. The CEC adopted an update to the EAP II in February 2008 that supplements the earlier EAPs and examines the State's ongoing actions in the context of global climate change.

State of California Energy Action Plan

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The current plan is the 1997 California Energy Plan. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and addressing their infrastructure needs; and encouragement of urban design that reduces VMT and accommodates pedestrian and bicycle access.

Assembly Bill 1493

In response to AB 1493, the CARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California's existing motor vehicle emission standards. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961), and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016. For passenger cars and light-duty trucks 3,750 pounds or less loaded vehicle weight (LVW), the 2016 GHG emission limits are approximately 37 percent lower than during the first year of the regulations in 2009. For medium-duty passenger vehicles and light-duty trucks 3,751 LVW to 8,500 pounds gross vehicle weight (GVW), GHG emissions are reduced approximately 24 percent between 2009 and 2016.

The CARB requested a waiver of federal preemption of California's Greenhouse Gas Emissions Standards. The intent of the waiver is to allow California to enact emissions standards to reduce carbon dioxide and other greenhouse gas emissions from automobiles in accordance with the

regulation amendments to the CCRs that fulfill the requirements of AB 1493. The U.S. EPA granted a waiver to California to implement its greenhouse gas emissions standards for cars.

Assembly Bill 1007

Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) directed the CEC to prepare a plan to increase the use of alternative fuels in California. As a result, the CEC prepared the State Alternative Fuels Plan in consultation with the state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Bioenergy Action Plan – Executive Order #S-06-06

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity.

California Executive Orders S-3-05 and S-20-06, and Assembly Bill 32

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80% below the 1990 levels by the year 2050. EO-S-20-06 establishes responsibilities and roles of the Secretary of Cal/EPA and state agencies in climate change

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that the CARB create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

EO S-13-08

EO S-13-08 was issued on November 14, 2008. The EO is intended to hasten California's response to the impacts of global climate change, particularly sea level rise, and directs state agencies to take specified actions to assess and plan for such impacts, including requesting the National Academy of Sciences to prepare a Sea Level Rise Assessment Report, directing the Business, Transportation, and Housing Agency to assess the vulnerability of the State's transportation systems to sea level rise, and requiring the Office of Planning and Research and the Natural

Resources Agency to provide land use planning guidance related to sea level rise and other climate change impacts.

The order also required State agencies to develop adaptation strategies to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. The adaption strategies report summarizes key climate change impacts to the State for the following areas: public health; ocean and coastal resources; water supply and flood protection; agriculture; forestry; biodiversity and habitat; and transportation and energy infrastructure. The report recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Assembly Bill 32 - Climate Change Scoping Plan

On December 11, 2008, the CARB adopted its *Climate Change Scoping Plan* (Scoping Plan), which functions as a roadmap of the CARB's plans to achieve GHG reductions in California required by Assembly Bill (AB) 32 through subsequently enacted regulations. The Scoping Plan contains the main strategies California will implement to reduce carbon dioxide-equivalent (CO_2e) emissions by 169 million metric tons (MMT), or approximately 30 percent, from the state's projected 2020 emissions level of 596 MMT of CO_2e under a business-as-usual scenario. (This is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002–2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.) The Scoping Plan also breaks down the amount of GHG emissions reductions the CARB recommends for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO_2e);
- the Low-Carbon Fuel Standard (15.0 MMT CO_2e);
- energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e); and
- a renewable portfolio standard for electricity production (21.3 MMT CO_2e).

The CARB updated the Scoping Plan in 2013 (*First Update to the Scoping Plan*) and again in 2017 (the *Final Scoping Plan*). The 2013 Update built upon the initial Scoping Plan with new strategies and recommendations, and also set the groundwork to reach the long-term goals set forth by the state. Successful implementation of existing programs (as identified in previous iterations of the Scoping Plan) has put California on track to meet the 2020 target. The 2017 Update expands the scope of the plan further by focusing on the strategy for achieving the state's 2030 GHG target of 40 percent emissions reductions below 1990 levels (to achieve the target codified into law by SB 32), and substantially advances toward the state's 2050 climate goal to reduce GHG emissions by 80 percent below 1990 levels.

The 2017 Update relies on the preexisting programs paired with an extended, more stringent Cap-and-Trade Program, to delivery climate, air quality, and other benefits. The 2017 Update identifies new technologically feasible and cost-effective strategies to ensure that California meets its GHG

reduction targets in a way that promotes and rewards innovation, continues to foster economic growth, and delivers improvements to the environment and public health.

Senate Bill 32

Senate Bill 32, which passed into law in 2016, sets the target of reducing greenhouse gas emissions to 40 percent below the 1990 level by the year 2030. SB 32 extends the original set of greenhouse gas targets provided by the passage of AB 32 (the Global Warmings Solutions Act of 2006). This new target sets an aggressive goalpost, helping the State along its pathway to achieve its longer-term goal of an 80 percent reduction in greenhouse gas emissions by the year 2050.

Senate Bill 743

SB 743, passed into law in 2013, changes the way that public agencies evaluate the transportation impacts of projects under CEQA. The proposed revisions to the State CEQA Guidelines would establish new criteria for determining the significance of a project's transportation impacts that will more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of GHGs. The 2017 Update to the Scoping Plan identified that slower VMT growth from more efficient land use development patterns would promote achievement of the state's climate goals.

As detailed in SB 743, the Governor's Office of Planning and Research (OPR) was tasked with developing potential metrics to measure transportation impacts and replace the use of delay and level of service (LOS). More detail about SB 743 is provided in the setting Chapter 17, "Traffic and Circulation."

In December 2018, OPR released its final changes to the CEQA Guidelines, including the addition of Section 15064.3 that would implement SB 743. In support of these changes, OPR also published its Technical Advisory on Evaluating Transportation Impacts in CEQA, which recommends that the transportation impact of a project be based on whether it would generate a level of vehicle miles traveled (VMT) per capita (or VMT per employee) that is 15 percent lower than existing development in the region. OPR's technical advisory explains that this criterion is consistent with Section 21099 of the California Public Resources Code, which states that the criteria for determining significance must "promote the reduction in greenhouse gas emissions". It is also consistent with the statewide per capita VMT reduction target developed by Caltrans in its Strategic Management Plan, which calls for a 15 percent reduction in per capita VMT, compared to 2010 levels, by 2020. Additionally, the California Air Pollution Control Officers Association (CAPCOA) determined that a 15 percent reduction in VMT is typically achievable for projects. CARB's First Update to the Climate Change Scoping Plan also called for local governments to set communitywide GHG reduction targets of 15 percent below then-current levels by 2020. Although not required, a lead agency may elect to be governed by the provisions of Section 15064.3 immediately. However, the provisions of Section 15064.3 do not apply statewide until July 1, 2020.

Executive Order B-48-18: Zero-Emission Vehicles

In January 2018, EO B-48-18 was signed into law and requires all State entities to work with the private sector to have at least 5 million zero-emission vehicles (ZEVs) on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 electric vehicle charging stations by 2025. It specifies that 10,000 of the electric vehicle charging stations should be direct current fast chargers. This Executive Order also requires all State entities to continue to partner with local and regional governments to streamline the installation of ZEV infrastructure. The Governor's Office of Business and Economic Development is required to publish a Plug-in Charging Station Design Guidebook and update the 2015 Hydrogen Station Permitting Guidebook to aid in these efforts. All State entities are required to participate in updating the 2016 Zero-Emissions Vehicle Action Plan (Governor's Interagency Working Group on Zero-Emission Vehicles 2016) to help expand private investment in ZEV infrastructure with a focus on serving low-income and disadvantaged communities. Additionally, all State entities are to support and recommend policies and actions to expand ZEV infrastructure at residential uses through the Low Carbon Fuel Standard Program, and recommend how to ensure affordability and accessibility for all drivers.

Assembly Bill 2076: California Strategy to Reduce Petroleum Dependence

In response to the requirements of Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000), the CEC and the CARB developed a strategy to reduce petroleum dependence in California. The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and the CARB in 2003. The strategy recommends that California reduce on-road gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles (SUVs); and increase the use of non- petroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

Assembly Bill 2188: Solar Permitting Efficiency Act

Assembly Bill (AB) 2188, enacted in California in 2015, required local governments to adopt a solar ordinance by September 30, 2015 that creates a streamlined permitting process that conforms to the bests practices for expeditious and efficient permitting of small residential rooftop solar systems. The act is designed to lower the cost of solar installations in California and further expand the accessibility of solar to more California homeowners. The bulk of the time and cost savings associated with a streamlined permitting process comes from the use of a standardized eligibility checklist and a simplified plan. This bill also shortens the number of days for those seeking Homeowner's Association (HOA) approval for a written denial of a proposed solar installation.

Governor's Low Carbon Fuel Standard (Executive Order #S-01-07)

Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard is incorporated into the State Alternative Fuels Plan and is one of the proposed discrete early action GHG reduction measures identified by the CARB pursuant to AB 32.

Senate Bill 97

Senate Bill (SB) 97 (Chapter 185, 2007) required OPR to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. OPR prepared its recommended amendments to the State CEQA Guidelines to provide guidance to public agencies regarding the analysis and mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions in draft CEQA documents. The Amendments became effective on March 18, 2010.

Senate Bill 375

Senate Bill (SB) 375 (Stats. 2008, ch. 728) (SB 375) was built on AB 32 (California's 2006 climate change law). SB 375's core provision is a requirement for regional transportation agencies to develop a Sustainable Communities Strategy (SCS) in order to reduce GHG emissions from passenger vehicles. The SCS is one component of the existing Regional Transportation Plan (RTP).

The SCS outlines the region's plan for combining transportation resources, such as roads and mass transit, with a realistic land use pattern, in order to meet a state target for reducing GHG emissions. The strategy must take into account the region's housing needs, transportation demands, and protection of resource and farmlands.

Additionally, SB 375 modified the state's Housing Element Law to achieve consistency between the land use pattern outlined in the SCS and the Regional Housing Needs Assessment allocation. The legislation also substantially improved cities' and counties' accountability for carrying out their housing element plans.

Finally, SB 375 amended the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) to ease the environmental review of developments that help reduce the growth of GHG emissions.

Executive Order B-30-15

On April 29, 2015, Governor Jerry Brown issued Executive Order (EO) B-30-15, which establishes a State GHG reduction target of 40 percent below 1990 levels by 2030. The new emission reduction target provides for a mid-term goal that would help the State to continue on course from reducing GHG emissions to 1990 levels by 2020 (per AB 32) to the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050 (per EO S-03-05). This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius – the warming threshold at which scientists say there will likely be major climate disruptions. EO B-30-15 also addresses the need for climate adaptation and directs State government to:

- Incorporate climate change impacts into the State's Five-Year Infrastructure Plan;
- Update the Safeguarding California Plan, the State climate adaptation strategy, to identify how climate change will affect California infrastructure and industry and what actions the State can take to reduce the risks posed by climate change;
- Factor climate change into State agencies' planning and investment decisions; and
- Implement measures under existing agency and departmental authority to reduce GHG emissions.

Advanced Clean Cars Program

In January 2012, the CARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025. The new rules strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's zero-emission vehicle regulation requires battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the state. The program will have significant energy demand implications as battery, fuel cell, and/or plug-in hybrid electric vehicle sales increase overtime, creating new demand for electricity services both in residential and commercial buildings (e.g. charging stations) as well as demand for new EV and hydrogen fuel cell charging stations. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. According to the CARB, by 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions than the statewide fleet in 2016.

California Building Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards (Standards), was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. On January 1, 2010, the California Building Standards Commission adopted CALGreen and became the first state in the United States to adopt a statewide green building standards code.

The 2016 update to the California Building Energy Efficiency Standards (the current version of the Standards) went into effect on January 1, 2017. The Standards are divided into three basic sets. First, there is a basic set of mandatory requirements that apply to all buildings. Second, there is a set of performance standards – the energy budgets – that vary by climate zone (of which there are 16 in California) and building type; thus, the Standards are tailored to local conditions. Finally, the third set constitutes an alternative to the performance standards, which is a set of prescriptive packages that are basically a recipe or a checklist compliance approach.

Compared with the previous version of the Standards, the 2016 Standards are expected to reduce statewide annual electricity consumption by approximately 281 gigawatt-hours per year, and natural gas consumption by 16 million therms per year, which is equivalent to a reduction in GHG emissions of approximately 160,000 MT CO_2e/year. The forthcoming update to the Standards (the 2019 Standards) will become effective on January 1, 2020, and will further increase energy efficiency requirements for new development beyond the 2016 update.

CEQA Guidelines Appendix F

In order to ensure that energy implications are considered in project decisions, Appendix F of the CEQA Guidelines requires that EIRs include a discussion of the potential energy impacts of Projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy. The goal of conserving energy implies the wise and efficient use of energy.

LOCAL

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) adopted a Policy on Global Warming and Stratospheric Ozone Depletion in April 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the Air Quality Management Plan. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives:

- Phase out the use and corresponding emissions of CFCs, methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- Phase out the large quantity use and corresponding emissions of HCFCs by the year 2000;
- Develop recycling regulations for HCFCs (e.g., SCAQMD Rules 1411 and 1415);
- Develop an emissions inventory and control strategy for methyl bromide; and
- Support the adoption of a California GHG emission reduction goal.

The legislative and regulatory activity detailed above is expected to require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

City of Lake Forest

The City of Lake Forest does not have any plans, policies, regulations, significance thresholds, or laws addressing climate change at this time. The City of Lake Forest has established ECOnomic, which is a voluntary green home education program. The City, through ECOnomic, encourages homeowners and building professionals to incorporate green building design into construction projects. The City also promotes utility company incentive programs to retrofit existing development with energy efficient lighting, air conditioning and heating systems to reduce energy consumption.

3.7.3 IMPACTS AND MITIGATION MEASURES

GREENHOUSE GASES THRESHOLDS OF SIGNIFICANCE

Per Appendix G of the CEQA Guidelines, climate change-related impacts are considered significant if implementation of the proposed project would do any of the following:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Analysis Approach

Cumulative impacts are the collective impacts of one or more past, present, and future projects that, when combined, result in adverse changes to the environment. In determining the significance of a project's contribution to anticipated adverse future conditions, a lead agency should generally undertake a two-step analysis. The first question is whether the *combined* effects from *both* the proposed project *and* other projects would be cumulatively significant. If the agency answers this inquiry in the affirmative, the second question is whether "the project's *incremental* effects are cumulatively considerable" and thus significant in and of themselves. The cumulative project list for this issue (climate change) comprises anthropogenic (i.e., human-made) GHG emissions sources across the globe and no project alone would reasonably be expected to contribute to a noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context and process for developing an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and, therefore, significant.

The CEQA Guidelines set forth a basic framework for developing a plan to reduce GHG emissions and acknowledges the role CEQA plays in ensuring the impacts of climate change are addressed. CEQA Guidelines Section 15183.5 provide a framework for the development of "Plans for the Reduction of Greenhouse Gas Emissions" for use in programmatic environmental review. Compliance with CEQA Guidelines section 15183.5 allows later project-specific environmental documents to tier from and/or incorporate by reference such existing programmatic review. CEQA Guidelines section 15183.5 (a) states that: "Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions."

The CEQA Guidelines provide that when a project is consistent with a general plan or climate action plan (CAP) that satisfies the criteria in Section 15183.5 (b), a lead agency may also presume that the project's GHG emissions are less than significant. CEQA Guidelines Section 15183.5

outlines the following six "Plan Elements" that should be included in a plan to reduce GHG emissions:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
- Be adopted in a public process following environmental review.

Consistent with this approach, the California Office of Planning and Research (OPR) recommends that lead agencies under CEQA create a plan to reduce GHG emissions that meets the goals of both CEQA and general plans, consistent with CEQA Guidelines Section 15183.5 (b). The OPR states that the GHG emissions reduction plan can be either a stand-alone CAP or directly part of the general plan. The City of Lake Forest has elected to include the GHG emissions reduction plan within the General Plan, which is summarized in the analysis below.

An analysis of the proposed project's consistency with the California statewide 2030 GHG emissions target of 40% below 1990 levels by 2030 (as encapsulated by SB 32) is provided herein, consistent with CEQA Guidelines Section 15183.5. Further, a qualitative analysis of the project's consistency with the California statewide 2050 target of 80% below 1990 levels by 2050 (as encapsulated in AB 32 and Executive Order S-03-05) is also provided herein.

Methodology

According to the OPR, it is preferable to create the plan to reduce GHG emissions concurrently with or closely following a general plan update. In addition, the OPR recommends the use of the SEEC Clearpath California tool. The SEEC ClearPath California tool, supported by the state and available without charge, provides a "five milestone" process for GHG inventory, planning, implementation, and monitoring, consistent with CEQA Guidelines Section 15183.[1] To this end, the City of Lake Forest has completed the "five milestone" process for GHG inventory, planning, implementation, and monitoring, utilizing the SEEC ClearPath California tool. The results of this analysis are provided in the following discussion and analysis (see *Impacts and Mitigation*

[1] See OPR's General Plan Guidelines (2017 Update), Chapter 8: Climate Change.

Measures), consistent with CEQA Guidelines Section 15183.5. The development of each of the elements in the "five milestone" process is provided below.

COMMUNITY GHG EMISSIONS INVENTORY

The 2015 inventory focused specifically on community-wide emissions sectors, which refers to emissions generated from sources and activities attributable to residents and businesses in the City. Consistent with guidance from the Governor's Office of Planning and Research (OPR), the 2015 community-wide inventory was developed with the SEEC ClearPath California tool, which is designed to be consistent with the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, commonly known as the U.S. Community Protocol (developed by ICLEI). The 2015 community inventory is focused specifically on community-wide GHG emissions and provides an assessment of activities throughout the community which contribute to City's total annual GHG emissions. Activity data was collected from utilities serving the City of Lake Forest, as well as other sources of publicly available information. The inventory is organized into sectors and sub-sectors based on various community activities. Table 3.7-1 (below) provides a summary of the sectors and sources included as part of the community-wide GHG emissions inventory.

TABLE 3.7-1: LAKE FOREST COMMUNITY GHG INVENTORY EMISSIONS SECTORS

GHG SECTOR	*ACTIVITIES AND SOURCES INCLUDED IN THE SECTOR*
Transportation & Mobile Sources	• On-road transportation (emissions from gasoline, diesel, and electricity); • Off-road transportation from construction vehicles and lawn equipment (emissions from gasoline and diesel)
Solid Waste	• Solid waste sent to landfills (emissions from fugitive methane at landfill)
Water & Wastewater	• Wastewater treatment processes (electricity); • Wastewater treatment process (fugitive methane and nitrous oxide)
Commercial Energy	• Commercial energy consumption (electricity and natural gas)
Industrial Energy	• Industrial energy consumption (electricity and natural gas)
Residential Energy	• Residential energy consumption (electricity and natural gas)
Upstream Impacts of Activities	• Transmission and Distribution (T&D) losses from electric power transmission

SOURCES: SEEC CLEARPATH TOOL; DATA FOR VARIOUS SECTORS PROVIDED AS FOLLOWS: FOR ON-ROAD TRANSPORTATION, DATA PROVIDED BY STANTEC AND KITTELSON & ASSOCIATES; FOR OFF-ROAD TRANSPORTATION, DATA PROVIDED FROM THE CARB'S OFF-ROAD MODEL; FOR SOLID WASTE, DATA PROVIDED BY CALRECYCLE; DATA FOR WASTEWATER TREATMENT PLANTS PROVIDED BY THE IRVINE RANCH WATER DISTRICT; DATA FOR COMMERCIAL ENERGY, INDUSTRIAL ENERGY, AND RESIDENTIAL ENERGY PROVIDE BY SOUTHERN CALIFORNIA EDISON (SCE) AND SOUTHERN CALIFORNIA GAS (SOCALGAS).

ESTABLISH A TARGET

The CARB's 2017 Scoping Plan (Scoping Plan), adopted in November 2017, provides guidance on how the State's established GHG reduction targets will be achieved through various State and local actions. As discussed in Chapter 5 of the Scoping Plan "Achieving Success", local jurisdictions working to set GHG reduction targets aligned with the State targets may use per capita emission estimates to recognize the GHG reductions needed to remain in line with State targets. For the

Plan for the Reduction of GHGs, proportional per capita targets were developed that express the level of GHG emissions reductions that would be needed locally between 2015 and the established future target years. These are in alignment with the State's recommended per capita targets of reducing statewide annual emissions to 6 $MTCO_2e$ by 2030, and a longer-term goal of reducing annual emissions to 2 $MTCO_2e$ per capita by 2050.

Importantly, the per capita targets reported in the Scoping Plan are framed as statewide 2030 targets that must be met on a statewide basis; however, this does not mean that the statewide per capita targets must be applied uniformly to every local jurisdiction. Considering that the per capita emissions reduction targets recommended in the Scoping Plan account for emissions from all sectors (including those sectors that are outside of the influence of a local jurisdiction), emissions inventories and reduction strategies adopted by local jurisdictions would necessarily exclude emissions sources that cannot be controlled at the local level. For example, the GWP sector (which includes categories such as refrigerants, hydroflorocarbons (CFCs), etc. which are regulated at the state and federal level) is a highly-regulated source of GHG emissions; thus, it is excluded from the City's inventory and forecasts. Thus, an adjustment to the State reductions achieved under the Scoping Plan to reflect applicable sectors for local GHG reduction planning and target-setting is necessary and appropriate. To that end, De Novo Planning Group developed recommended GHG reduction targets that adjust for the GHG emissions sectors that cannot be controlled at the local level.[2]

Based on this approach, the following recommended GHG reduction targets have been developed by De Novo Planning Group to reduce the City's annual GHG emissions consistent with the framework used to develop the State's per capita targets. Additionally, a GHG reduction goal has been included that would ensure the City is consistent with the State's long-term 2050 goal of reducing statewide emissions to 80 percent below 1990 levels as stated in Executive Order S-03-05 and consistent with AB 52. The City targets are:

- 3.99 $MTCO_2e$ per capita by 2030
- 2.66 $MTCO_2e$ per capita by 2040; and
- 1.33 $MTCO_2e$ per capita by 2050.

2030, 2040, AND 2050 COMMUNITY-WIDE GREENHOUSE GAS EMISSIONS FORECASTS

To understand what annual GHG emissions will look like in the future, the future emissions growth scenarios were modeled based on projected trends in growth of population, jobs, housing, and non-residential square footage for the target years 2030 and 2040, as well as a longer-term 2050

[2] Specifically, the per capita targets were adjusted for Lake Forest by calculating the proportion of GHG emissions sectors that are affected by land use changes out of the net California emissions provided within the *California Greenhouse Gas Inventory in 1990*. The proportion of GHG emissions that are affected by land use changes include 286.7 $MMCO_2e$ out of a total of 430.7 $MMTCO_2e$, or approximately 66.6% of the total California State GHG inventory. This factor (66.6%) was applied to the State's recommended per capita targets contained with the CARB's 2017 Scoping Plan, to derive targets that are locally appropriate. Separately, since the CARB didn't provide year a 2040 per capita target within the 2017 Scoping Plan, the year 2040 per capita target was derived by averaging the 2030 and 2050 targets.

goal, based on the State's established GHG reduction goals. Emissions forecasts allow the City to assess the effectiveness of various GHG reduction strategies over time. Assumptions were provided from data provided during the General Plan Update planning process.

The basis for all emission growth scenarios is the Business-as-Usual (BAU) forecast. A BAU forecast predicts how GHG emissions will increase assuming population, jobs, housing, and non-residential square footage continue to increase based on the City's growth rate projections. The City adjusted the BAU forecast to incorporate the land use assumptions incorporated into the General Plan (proposed project). The City also adjusted the BAU forecast to demonstrate how Federal and State actions will impact local emissions for various sector (independent of local GHG reduction activities). The Federal and State actions included in this adjustment have been approved, programmed, and/or adopted. Incorporating them into the forecast and reduction assessment provides a more accurate picture of future emissions growth and the responsibility and ability of local governments versus the State to reduce GHG emissions.

A brief description of each of these Federal and State actions, which are incorporated into the legislative-adjusted BAU scenario, are provided below.

- **Assembly Bill 1493 (Pavley Clean Car Standards)**. Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2009. It is expected that new vehicles sold in California will result in an average of 16 percent less GHG emissions than models previous to 2009.

- **Advanced Clean Car Standards**. In 2012, the CARB adopted the Advanced Clean Cars program, which established coordination between the CARB, the U.S. Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA) to set limits on the emission of smog-causing pollutants and GHGs for vehicle model years 2015 through 2025.

- **Renewable Portfolio Standard**. First established under SB 1078 and updated through various legislation, the Renewable Portfolio Standard (RPS) requires that all electricity retailers in the State sell a certain percentage of electricity from renewable resources. SB X1-2, signed in 2011, requires 33 percent of electricity sales to come from renewable resources by 2020. In 2018, SB 100 increased California's Renewable Energy Portfolio targets to 52 percent renewables by 2027 and 60 percent renewables by 2030. SB 100 also established a new requirement to achieve 100 percent zero-carbon electricity by 2045.

- **Title 24 – Building Energy Efficiency Standards**. The California Energy Code, first established in 1978 by the California Energy Commission (CEC), sets energy efficiency standards for new construction of residential and non-residential buildings in the State. These standards are routinely updated to incorporate new energy efficiency standards and methods which reduce energy use. The 2016 Energy Efficiency Standards are the most recent version of the regulation, which took effect on January 1st, 2017. The 2019 Title 24 Part 6 Building Energy Efficiency Standards were adopted by CEC on May 9, 2018 and will take effect on January 1, 2020. CEC estimates that the combination of mandatory on-site

renewable energy and prescriptively-required energy efficiency features will result in new residential construction that uses 53 percent less energy than the 2016 standards. Nonresidential buildings are anticipated to reduce energy consumption by 30 percent compared to the 2016 standards primarily through prescriptive requirements for high-efficiency lighting (CEC 2018).

- **AB 341**. Established in 2011, this policy sets the goal that no less than 75 percent of solid waste generated in the State be reduced, recycled, or composted by the 2020. Cal-Recycle, the State agency tasked with guiding implementation of this policy, are providing strategies for local jurisdiction to meet these targets. The five priority strategies proposed by Cal-Recycle are: 1) Moving Organics Out of the Landfill, 2) Expanding Recycling/Manufacturing Infrastructure, 3) Exploring New Approaches for State and Local Funding of Sustainable Waste Management Programs, 4) Promoting State Procurement of Post-Consumer Recycled Content Products, and 5) Promoting Extended Producer Responsibility.

- **SB X7-7 (The Water Conservation Act of 2009)**. This legislation requires that water suppliers in the State increase water use efficiency with the goal of reducing urban water consumption 20 percent by the year 2020. The legislation includes 18 actions to reduce water consumption, which the Department of Water Resources (DWR) is required to implement through various policy mechanisms. The actions under SB X7-7 include a variety of activities which will be undertaken by DWR including strategies to convene specific tasks forces to address specific water conservation issues, work with the California Urban Water Conservation Council to provide a public information platform for reporting on water use metrics in California, develop a method for calculating urban water use to track the 20 percent reduction required in the law, adopt regulations for implementation of SB X7-7, report to the Legislature on the progress toward achieving the 20 percent reduction in urban water use, and update the Urban Water Management Plan (UWMP) Guidebook for local jurisdictions. The projects also include strategies specific to the agriculture and urban sectors such as quantifying the efficiency of agricultural water use and updating criteria for funding sources to implement agricultural and urban water conservation projects.

- **Fuel Efficiency Standards for Medium- and Heavy-Duty Vehicles**. In 2016, the U.S. EPA and NHTSA adopted fuel efficiency standards for medium- and heavy-duty vehicles which focus on vehicle and engine performance standards for model years 2018-2027 for certain tractor-trailers and model years 2021-2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks.

- **USEPA Off-Road Compression-Ignition Engine Standards. (40 CFR Part 89).** This regulation establishes federal standards for the phasing in of EPA diesel engine tiers for off-road compression-ignition equipment. The regulation serves to reduce emissions by integrating engine and fuel control systems to achieve emissions reductions and requiring equipment manufacturers to produce engines with advance emissions control technologies.

ENERGY CONSERVATION THRESHOLDS OF SIGNIFICANCE

The proposed project would result in a significant impact on energy use if it would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

In order to determine whether or not the proposed project would result in a significant impact on energy use, this EIR includes an analysis of proposed project energy use, as provided under *Impacts and Mitigation Measures*, below. A description of the methodology used to estimate energy emissions is provided within the analysis provided under *Impacts and Mitigation Measures*.

IMPACTS AND MITIGATION MEASURES

Impact 3.7-1: General Plan implementation has the potential to generate GHG emissions that could have a significant impact on the environment (Less than Significant)

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on Earth. A project's GHG emissions are at a micro-scale relative to global emissions, but could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. Implementation of the proposed project would contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 and other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O), from mobile sources and utility usage. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

While the City of Lake Forest does not currently have any adopted plans or policies related to GHG reductions, the City has developed the Proposed General Plan to be a "qualified GHG reduction plan," consistent with California CEQA Guidelines section 15183.5 (b). These guidelines set forth a basic framework for developing a plan to reduce GHG emissions and acknowledges the role CEQA plays in ensuring the impacts of climate change are addressed. CEQA Guidelines Section 15183.5 (b) outlines six "Plan Elements" that should be included in a plan to reduce GHG emissions, which are provided herein. The six "Plan Elements" are to:

- Plan Element 1: Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

- Plan Element 2: Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
- Plan Element 3: Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Plan Element 4: Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Plan Element 5: Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels; and
- Plan Element 6: Be adopted in a public process following environmental review.

The following analysis includes a breakdown of the results of each of the six plan elements, as identified by CEQA Guidelines section 15183.5, as prepared by the City of Lake Forest.

COMMUNITY GHG EMISSIONS INVENTORY, FORECASTS, AND TARGETS

CEQA Guidelines Section 15183.5 requires the quantification of GHG emissions generated by Lake Forest (Plan Element 1), the establishment of GHG emissions targets that demonstrate a level which the contribution of GHG emissions from activities covered by the plan would not be cumulatively considerable (Plan Element 2), and forecasts for future years (Plan Element 3).

CEQA Guidelines Section 15183.5 Plan Element 2 requires the establishment of a GHG emissions level, based on substantial evidence, below which the contribution of GHG emissions from activities covered by the plan would not be cumulatively considerable. The target years 2030 and 2040 were selected, based on the target year for SB 32 (2030) and the Lake Forest General Plan horizon year (2040).

To this end, the City of Lake Forest has developed community GHG emissions inventories for baseline year 2015 and projections for future years 2030, 2040, and 2050, and targets for each future year based on the latest guidance from the CARB. Based on this approach recommended by the CARB 2017 Scoping Plan, the following recommended per capita GHG reduction targets for 2030, 2040, and 2050 have been developed by De Novo Planning Group to reduce the City's annual GHG emissions consistent with the framework used to develop the State's per capita targets. The year 2050 target is provided for informational purposes only, since it is outside of the General Plan's (i.e. proposed project) horizon year. As established by Policy RR-4.8, the City targets are:

- 3.99 MT CO_2e per capita by 2030
- 2.66 MT CO_2e per capita by 2040; and
- 1.33 MT CO_2e per capita by 2050.[3]

Table 3.7-2 provides the 2015 baseline year community GHG emissions inventory, as well as an estimate of each inventory sector's per capita contribution to the City's total per capita GHG emissions for year 2015. Based on existing population levels for baseline year 2015 and forecasted population as provided in Table 2.0-3 of the Project Description (See *Chapter 2.0: Project Description* of this DEIR), per capita emissions in baseline year 2015 are estimated at 5.18 MT CO_2e per capita (derived by dividing 414,479 MT CO_2e by a 2015 year population of 80,070).

Tables 3.7-3 through 3.7-5 provide proposed project forecasts for future year community GHG emissions by sector, for years 2030, 2040, and 2050, respectively. Two separate forecast scenarios are provided for each forecast year. The first forecast scenario, the "BAU Plus Proposed Project" scenario, reflects the BAU scenario after proposed project (General Plan) land use assumptions are incorporated (to reflect the land use scenario provided in the General Plan). This forecast reflects is the long-term forecast for the General Plan and includes trends reflecting existing and planned local programs and policies, including those identified in the General Plan. The "Legislative-adjusted BAU Plus Proposed Project" scenario builds on the "BAU Plus Proposed Project" scenario by further incorporating the GHG reduction benefits of these Federal and State actions that are designed to reduce GHG emissions, such as the Pavley Clean Car Standards (AB 1493) and the Renewable Portfolio Standard (established under SB 1078).[4]

[3] Note: Buildout year for the General Plan (i.e. proposed project) is year 2040; therefore, analysis of the proposed project's emissions in 2050 are included here for informational purposes only).

[4] See the discussion under Methodology for a full list of federals/state actions that are incorporated into the legislative-adjusted BAU scenario.

TABLE 3.7-2: LAKE FOREST COMMUNITY GHG EMISSIONS INVENTORY – BASELINE YEAR 2015

GHG SECTOR	*MT CO_2E/YEAR*	*PER CAPITA MT CO_2E/YEAR*
Transportation & Mobile Sources	220,490	2.75
Solid Waste	29,389	0.37
Water & Wastewater	6,337	0.08
Commercial Energy	67,817	0.85
Industrial Energy	2,555	0.03
Residential Energy	79,756	1.00
Upstream Impacts of Activities	8,132	0.10
Total	**414,479**	**5.18**

SOURCE: SEEC CLEARPATH TOOL; DE NOVO PLANNING GROUP.

TABLE 3.7-3: LAKE FOREST COMMUNITY GHG EMISSIONS INVENTORY – PROJECT FUTURE YEAR 2030

GHG SECTOR	*BAU PLUS PROPOSED PROJECT SCENARIO (MT CO_2E/YEAR)*	*LEGISLATIVE-ADJUSTED BAU PLUS PROPOSED PROJECT SCENARIO (MT CO_2E/YEAR)*
Transportation & Mobile Sources	260,353	177,397
Solid Waste	39,688	24,354
Water & Wastewater	8,776	8,776
Commercial Energy	92,547	49,390
Industrial Energy	3,488	3,488
Residential Energy	107,705	51,113
Upstream Impacts of Activities	11,261	6,435
Total	**523,818**	**320,954**

SOURCE: SEEC CLEARPATH TOOL; DE NOVO PLANNING GROUP.

TABLE 3.7-4: LAKE FOREST COMMUNITY GHG EMISSIONS INVENTORY – PROJECT FUTURE YEAR 2040

GHG SECTOR	*BAU PLUS PROPOSED PROJECT SCENARIO (MT CO_2E/YEAR)*	*LEGISLATIVE-ADJUSTED BAU PLUS PROPOSED PROJECT SCENARIO (MT CO_2E/YEAR)*
Transportation & Mobile Sources	302,812	184,062
Solid Waste	52,152	32,002
Water & Wastewater	11,798	11,798
Commercial Energy	122,773	90,677
Industrial Energy	4,627	4,627
Residential Energy	141,531	38,657
Upstream Impacts of Activities	15,140	8,652
Total	**650,834**	**370,476**

SOURCE: SEEC CLEARPATH TOOL; DE NOVO PLANNING GROUP.

TABLE 3.7-5: LAKE FOREST COMMUNITY GHG EMISSIONS INVENTORY – PROJECT FUTURE YEAR 2050

GHG SECTOR	*BAU PLUS PROPOSED PROJECT SCENARIO (MT CO_2E/YEAR)*	*LEGISLATIVE-ADJUSTED BAU PLUS PROPOSED PROJECT SCENARIO (MT CO_2E/YEAR)*
Transportation & Mobile Sources	352,196	210,627
Solid Waste	68,531	42,053
Water & Wastewater	15,862	15,862
Commercial Energy	162,872	21,772
Industrial Energy	6,139	6,139
Residential Energy	185,979	38,311
Upstream Impacts of Activities	20,356	11,632
Total	**811,933**	**346,395**

SOURCE: SEEC CLEARPATH TOOL; DE NOVO PLANNING GROUP.

As shown in Tables 3.7-3 through 3.7-5, GHG emissions in Lake Forest are estimated to increase over time under the BAU Plus Proposed Project scenario. However, under the Legislative-adjusted BAU Plus Proposed Project scenario, GHG emissions in Lake Forest are forecasted to decline from the 2015 baseline through around 2030, then peak around the 2040 buildout year, before declining through to 2050. The reductions in GHG emission around 2030 and again around 2050 are primarily due to aggressive actions by the State to increase energy efficiency both at the building and utility levels (e.g. via increasing Title 24 building energy efficiency standards and the Renewable Portfolio Standard) during these timeframes. Efforts to reduce on-road transportation GHG emissions (such as by the Pavley Clean Car Standards), also play a major role in reducing GHG emissions through the forecast years. Overall, Federal and State actions reduce overall BAU Plus Proposed Project GHG emissions by approximately 39% in year 2030, 43% in year 2040, and 57% in year 2050.

Based on forecasted population levels for each forecast year and the results provided in the preceding tables, after taking into account federal and state actions (i.e. as provided under the

Legislative-adjusted BAU Plus Proposed Project scenarios), per capita emissions are estimated to decline from 5.18 MT CO_2e to 2.83 MT CO_2e in year 2030 (derived by dividing 320,954 MT CO_2e by a projected 2030 year population of 113,401), 2.43 MT CO_2e in year 2040 (derived by dividing 650,834 MT CO_2e by a projected 2040 year population of 152,462), and 1.69 MT CO_2e in year 2050 (derived by dividing 346,395 MT CO_2e by a projected 2050 year population of 204,977). Table 3.7-6 provides a summary of these per capita results.

TABLE 3.7-6: LAKE FOREST COMMUNITY GHG EMISSIONS PER CAPITA EMISSIONS AND TARGETS (MT CO_2E)

YEAR	PER CAPITA EMISSIONS (LEGISLATIVE-ADJUSTED BAU PLUS PROPOSED PROJECT SCENARIO)	POPULATION PROJECTIONS	PER CAPITA EMISSIONS	PER CAPITA TARGET	ACHIEVES PER CAPITA TARGET?
2015	414,479	80,070	5.18	N/A	N/A
2030	320,954	113,401	2.83	3.99	Y
2040	370,476	152,462	2.43	2.66	Y
2050	346,395	204,977	1.69	1.33	N

SOURCE: SEEC CLEARPATH TOOL; DE NOVO PLANNING GROUP.

As shown in Table 3.7-6, the proposed project would achieve the per capita GHG targets for years 2030 and 2040 (buildout year). Although Table 3.7-6 identifies that the proposed project would not meet the per capita GHG target for year 2050, year 2050 is outside of the scope of the proposed project, since the proposed project buildout year would occur by 2040. Therefore, year 2050 information is provided herein for informational purposes only.

GHG REDUCTION MEASURES

CEQA Guidelines Section 15183.5 Plan Element 4 requires the specification of measures or a group of measures, including performance standards, that would achieve the specified emissions level. However, as described above, after accounting for Federal and State GHG reducing actions in future years, City of Lake Forest community per capita emissions in years 2030 and 2040 would be below the per capita targets established consistent with the CARB's 2017 Scoping Plan. Nevertheless, a range of policies and actions have been included in the General Plan that would further reduce potential GHG emissions within Lake Forest and ensure that the City's General Plan serves as a qualified greenhouse gas reduction plan.

It should also be noted that the City has taken a proactive and comprehensive approach to planning within the General Plan that would collectively work to help reduce GHG emissions throughout the life of the General Plan. For example, the Land Use Element promotes a mix of land use densities and uses that would promote walkability and infill development. The Mobility Element promotes reductions in vehicle miles traveled (VMT), roadway network efficiency upgrades, complete streets, and enhanced connectivity to promote walking, biking, and transit use. The Recreation and Resources Element includes provisions for the protection of open space, reductions in air quality emissions, tree preservation, the protection of native habitat and waterways, and reductions in the generation of solid waste. The Public Facilities Element promotes water conservation and energy reduction efforts.

MONITORING

CEQA Guidelines Section 15183.5 Plan Element 5 requires the establishment of a mechanism to monitor the GHG Reduction Plan's progress toward achieving the target reduction level and to require amendment if the plan is not achieving specified levels. To this end, the lead agency (City of Lake Forest) has committed to updating its GHG inventory every five years to comply with this required element. The SEEC Clearpath California tool will be used to allow for efficient monitoring of Lake Forest's community GHG levels in future years. If GHG emissions are found to be higher in future years than what is projected within the General Plan, additional community GHG reduction measures would be adopted to the City of Lake Forest to ensure continued consistency with CEQA Guidelines Section 15183.5.

PUBLIC ADOPTION

CEQA Guidelines Section 15183.5 Plan Element 6 requires local governments adopting general plans that incorporate GHG emissions reduction policies to analyze the impact of the policies on the environment. Such impacts should be analyzed and, if necessary, mitigated through an environmental document. Impacts relating to GHG emissions reduction policies are analyzed throughout this EIR, as they are incorporated as part of the General Plan's comprehensive approach to land use and policy guidance. No further analysis is required here.

CONCLUSION

As demonstrated in the analysis provided above, the proposed project is consistent with the CEQA Guidelines Section 15183.5 framework for developing a plan to reduce GHG emissions. The proposed project has been developed to be consistent with the six "Plan Elements" that should be included in a plan to reduce GHG emissions. Upon adoption of the Proposed General Plan, and implementation of the policies and actions identified below, the City of Lake Forest would not exceed the per capita GHG emission targets established to ensure compliance with SB 32 and other California legislation for future year 2030 and General Plan buildout year 2040. Therefore, the proposed project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. There is a **less than significant** impact following adoption and implementation of the policies and actions listed below.

As future development projects are received and reviewed by the City in subsequent years, those projects will be reviewed for consistency with the General Plan and all relevant State-level programs and requirements. All future projects must implement the most current version of the Title 24 energy efficiency requirements, as required by State law. Consistency with the General Plan and other mandatory State-level programs would ensure that future project-level contributions to global climate change would be less than significant.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

RR-4.8: Local Reduction Targets. The City of Lake Forest establishes the following per capita GHG reduction targets, in order to meet the requirements established by the state under AB 32 and SB 32, consistent with the CARB's 2017 Scoping Plan:

- *3.99 MT CO_2e per capita by 2030*
- *2.66 MT CO_2e per capita by 2040; and*
- *1.33 MT CO_2e per capita by 2050.*

RR-4.9: GHG Reduction. Consider and adopt new policies and programs that will help to provide energy efficient alternatives to fossil fuel use and reduce consumption in order to reduce greenhouse gas emissions.

RR-4.10: Carbon Reduction. Expand the number of parks and trees in Lake Forest to provide a larger carbon sink or area containing natural sources that retain more carbon than what those sources emit.

PS-7.10: Leadership. Demonstrate leadership in local climate planning efforts through a range of tangible actions and policies at the municipal operations level.

ACTIONS

RR-4e: Monitor GHG emissions generated by the community over time for consistency with the established GHG reduction targets, and update the City's community GHG Inventory every five years. In the event that the City determines that ongoing efforts to reduce GHG emissions are not on track to meet the City's adopted GHG reduction targets, the City shall establish and adopt new and/or revised GHG reductions measures that will effectively meet the established GHG reduction targets.

RR-4f: Explore the feasibility of providing the necessary facilities and infrastructure to facilitate the use of City-owned low or zero-emission vehicles such as electric vehicle charging facilities and conveniently located alternative fueling stations.

RR-4g: Evaluate and consider multi-modal transportation benefits to all City employees, such as free or low-cost monthly transit passes. Encourage employer participation in similar programs. Encourage new transit/shuttle services and use.

RR-4h: Evaluate and consider the feasibility of allowing private bicycle rental companies to operate in Lake Forest.

RR-4i: Encourage community car-sharing and carpooling.

RR-4j: Support the establishment and expansion of a regional network of electric vehicle charging stations and encourage the expanded use of electric vehicles.

RR-4k: Establish standards and requirements for electric vehicle parking, including the installation of electric vehicle charging stations, in new development projects.

RR-4l: Periodically review and update the City's Green Building Program to reflect best practices, such as encouraging the use of cement substitutes and recycled building materials for new construction.

RR-4m: Update the City's Green Building Program to promote the reduction of urban heat islands through vegetation management and cool surfaces. Encourage multi-family residential and non-residential development to increase the use of higher-albedo materials for surfaces including roofs, parking areas, driveways, roads, and sidewalks. Encourage developments with parking lot areas to shade these areas with vegetation or solar panels when appropriate. Support various programs to plant and maintain trees, which can also contribute to a reduction of urban heat islands.

PS-7a: Provide information and resources to the public and businesses regarding steps the City is taking to address the issue of climate change.

PS-7b: Study the transition to energy-efficient street lights, such as LEDs, for City-owned light facilities.

PS-7c: Consider purchasing only electric or alternative-energy vehicles for the City vehicle fleet, as appropriate, based on the intended use of the vehicle.

PS-7d: Evaluate the feasibility for government-constructed and/or -operated new development to exceed the CalGreen Tier 1, or successor program, standards.

PS-7e: Promote the use of sustainable and carbon-nuetral energy sources in new development as directed in the City's Green Building Program.

PS-7f: Explore using renewable energy and clean generation technologies such as solar, wind, biogas, or fuel cells to power City facilities where appropriate.

Impact 3.7-2: General Plan implementation has the potential to conflict with adopted plans, policies, or regulations adopted for the purpose of reducing greenhouse gas emissions (Less than Significant)

As described under Impact 3.7-1, the proposed project (Lake Forest General Plan) would satisfy the requirements as provided under CEQA Guidelines Section 15183.5, thus ensuring that the proposed project would be considered a qualified Plan for the Reduction of Greenhouse Gas Emissions. As further provided under Impact 3.7-1, the per capita GHG reduction target developed for the Plan for the Reduction of Greenhouse Gas Emissions is consistent with the per capita GHG reduction targets provided in the CARB's 2017 Scoping Plan, which were developed by the CARB to ensure compliance with AB 32, SB 32, and consistent with Executive Order S-03-05. These laws established a statewide reduction in GHG emissions to 15% below 1990 levels by 2020 (under AB 32), a 40% below 1990 levels by 2030 (under SB 32), and 80% below 1990 levels by 2050 (under AB 32 and consistent with Executive Order S-03-05).

As demonstrated under Impact 3.7-1, the proposed project would be consistent with the CARB's 2017 Scoping Plan, and thus all current statewide GHG reduction laws (i.e. AB 32 and SB 32) relevant to the proposed project that have been adopted to reduce GHG emissions.

More specifically, the CARB's 2017 Scoping Plan, adopted in November 2017, provides guidance on how the State's established GHG reduction targets will be achieved through various State and local actions. As discussed in Chapter 5 of the Scoping Plan "Achieving Success", local jurisdictions working to set GHG reduction targets aligned with the State targets may use per capita emission estimates to recognize the GHG reductions needed to remain in line with State targets.

As provided under Impact 3.7-1, the proposed project would reduce emissions to below the per capita thresholds through buildout of the General Plan (i.e. for years 2030 and 2040), which ensures that the proposed project is consistent with all GHG reduction targets established for the state. Therefore, the proposed project would not conflict with the State of California's GHG reduction goals and targets.

On the local level, the City of Lake Forest has established ECOnomic, which is a voluntary green home education program. The City, through ECOnomic, encourages homeowners and building professionals to incorporate green building design into construction projects. The proposed project would not conflict with this program. Separately, the SCAQMD adopted a Policy on Global Warming and Stratospheric Ozone Depletion in April 1990. However, this policy did not set a GHG reduction target or goal, and the proposed project would not conflict with this policy. There are currently no other local policies relevant to the proposed project adopted for the purpose of reducing GHG emissions.

The proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. There is a **less than significant** impact relative to this topic.

Impact 3.7-3: General Plan implementation has the potential to result in a significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources, or conflict with or obstruct a state or local plan for renewable energy or energy efficiency (Less than Significant)

The State CEQA Guidelines require consideration of the potentially significant energy implications of a project. CEQA requires mitigation measures to reduce "wasteful, inefficient and unnecessary" energy usage (Public Resources Code Section 21100, subdivision [b][3]). According to Appendix F of the CEQA Guidelines, the means to achieve the goal of conserving energy include decreasing overall energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources. In particular, a project would be considered "wasteful, inefficient, and unnecessary" if it were to violate state and federal energy standards and/or result in significant adverse impacts related to project energy requirements, energy inefficiencies, energy intensiveness of materials, cause significant impacts on local and regional energy supplies or generate requirements for additional capacity, fail to comply with existing energy standards,

otherwise result in significant adverse impacts on energy resources, or conflict or create an inconsistency with applicable plan, policy, or regulation.

The proposed project is the updated Lake Forest General Plan, with a horizon year of 2040. Buildout of the General Plan includes residential, commercial, office, industrial, mixed-use, open space, and other land uses (see Chapter 2.0: Project Description for further detail). The amount of energy used in the Planning Area at buildout would directly correlate to the type and size of development, the energy consumption associated with unit appliances, outdoor lighting, and energy use associated with other buildings and activities. Other major sources of Plan Area energy consumption include fuel used by vehicle trips generated during construction and operational activities, and fuel used by off-road and on-road construction vehicles during construction. The following discussion provides calculated levels of energy use expected for the Project, based on commonly used modelling software (i.e. CalEEMod v.2016.3.2 and the California Air Resource Board's EMFAC2017). The following analysis provides an estimate of the energy consumption in the Planning Area in buildout year 2040.

ELECTRICITY AND NATURAL GAS

At buildout, the City of Lake Forest's electricity and natural gas consumption would be used primarily to power buildings (all types of buildings, including residential, commercial, office, industrial, public, etc.). Total annual electricity (kWh) and natural gas (kBTU) usage associated with operational activities at proposed project buildout are shown in Table 3.7-7, below (as provided by CalEEMod).

TABLE 3.7-7: PROJECT OPERATIONAL NATURAL GAS AND ELECTRICITY USAGE (UNMITIGATED SCENARIO)

ELECTRICITY (KWH/YEAR)	*NATURAL GAS (KBTU/YEAR)*	*CO_2E EMISSIONS (MT/YEAR)*
483,740,060	1,171,371,280	217,561

SOURCE: CALEEMOD (V.2016.3.2)

According to CalEEMod's *Appendix A: Calculation Details for CalEEMod*, CalEEMod uses the California Commercial End Use Survey (CEUS) database to develop energy intensity value for non-residential buildings. The energy use from residential land uses is calculated based on the Residential Appliance Saturation Survey (RASS). Similar to CEUS, this is a comprehensive energy use assessment that includes the end use for various climate zones in California.

FUEL CONSUMPTION - ON-ROAD VEHICLES (OPERATION)

Buildout of the General Plan would generate vehicle trips during its operational phase. Based on the traffic study prepared for the proposed project (Kittelson & Associates, 2019), the proposed project would generate approximately 3,958,507 daily vehicles trips. In order to calculate operational on-road vehicle energy usage and emissions, default trip lengths generated by CalEEMod were used, which are based on the project location and urbanization level parameters De Novo (the EIR consultant) selected within CalEEMod (i.e. "Orange County" and "Urban", respectively). These values are provided by the individual districts or use a default average for the state, depending on the location of the Project (CAPCOA, 2017). Based on Year 2040 gasoline and diesel MPG (miles per gallon) factors for individual vehicle classes as provided by EMFAC2017, De

Novo derived weighted MPG factors for operational on-road vehicles of approximately 39.1 MPG for gasoline and 16.2 MPG for diesel vehicles. With this information, De Novo calculated as a conservative estimate that on-road vehicle energy usage in the Planning Area at buildout year 2040 would be approximately 94,332 gallons of gasoline and 16,486-gallons of diesel fuel per day, on average, or 34,431,177 annual gallons of gasoline and 6,017,510 annual gallons of diesel fuel.

FUEL CONSUMPTION - ON-ROAD VEHICLES (CONSTRUCTION)

The proposed project would also generate on-road vehicle trips during construction activities (from construction workers, vendors, and haulers). Estimates of vehicle fuel consumed were derived based on the assumed construction schedule, vehicle trip lengths and number of workers per construction phase as provided by CalEEMod (v 2016.3.2), and Year 2040 gasoline and diesel MPG factors provided by EMFAC2017. Table 3.7-8, below, describes gasoline and diesel fuel used by on-road mobile sources during each phase of the construction schedule. As shown, the vast majority of on-road mobile vehicle fuel used during the construction activities during buildout of the General Plan would occur during the building construction phase. See Appendix C for a detailed calculation.

TABLE 3.7-8: ON-ROAD MOBILE FUEL GENERATED BY PROJECT CONSTRUCTION ACTIVITIES – BY PHASE

CONSTRUCTION PHASE	*TOTAL DAILY WORKER TRIPS[(A)]*	*TOTAL DAILY VENDOR TRIPS[(A)]*	*TOTAL DAILY HAULING TRIPS[(A)]*	*GALLONS OF GASOLINE FUEL[(B)]*	*GALLONS OF DIESEL FUEL[(B)]*
Site Preparation	18	0	0	1,803	0
Grading	20	0	0	1,995	0
Paving	15	0	0	1,496	0
Building Construction	199	68	0	297,628	171,429
Architectural Coating	199	0	0	51,265	0
Total	**N/A**	**N/A**	**N/A**	**354,187**	**171,429**

NOTE: [(A)] PROVIDED BY CALEEMOD. [(B)]SEE APPENDIX C FOR FURTHER DETAIL.
SOURCE: CALEEMOD (V.2016.3.2); EMFAC2017.

OFF-ROAD VEHICLES (CONSTRUCTION)

Off-road construction vehicles would use diesel fuel during construction activities. A non-exhaustive list of off-road constructive vehicles expected to be used during construction activities includes: cranes, forklifts, generator sets, tractors, excavators, and dozers. Based on the total amount of CO_2 emissions expected to be generated by the proposed project (as provided by the CalEEMod output), and a CO_2 to diesel fuel conversion factor (provided by the U.S. Energy Information Administration), the proposed project would use a total of approximately 113,220 gallons of diesel fuel for off-road construction vehicles (during the site preparation and grading phases). Detailed calculations are provided in Appendix C.

CONCLUSION

Buildout of the General Plan would use energy resources for the operation of buildings (electricity and natural gas), for on-road vehicle trips (e.g. gasoline and diesel fuel), and from off-road construction activities (e.g. diesel fuel) associated with buildout of the General Plan. Each of these

activities would require the use of energy resources. Developers of individual projects within the Planning Area would be responsible for conserving energy, to the extent feasible, and would rely heavily on reducing per capita energy consumption to achieve this goal, including through Statewide and local measures.

Buildout of the General Plan would be in compliance with all applicable federal, state, and local regulations regulating energy usage. For example, SCE is responsible for the mix of energy resources used to provide electricity for its customers, and it is in the process of implementing the Statewide Renewable Portfolio Standard (RPS) to increase the proportion of renewable energy (e.g. solar and wind) within its energy portfolio.

SCE is expected to achieve at least 60% renewables by 2030, and 100 percent zero-carbon electricity by 2045 (in compliance with SB 100). Additionally, energy-saving regulations, including the latest State Title 24 building energy efficiency standards ("part 6"), would be applicable to the proposed project. Other Statewide measures, including those intended to improve the energy efficiency of the statewide passenger and heavy-duty truck vehicle fleet (e.g. the Pavley Bill and the Low Carbon Fuel Standard), would improve vehicle fuel economies, thereby conserving gasoline and diesel fuel. These energy savings would continue to accrue over time. Furthermore, additional project-specific the sustainability features individual development projects could further energy consumption of individual projects. The proposed project would also be in compliance with the planning documents described previously within this section.

As a result, the proposed project would not result in any significant adverse impacts related to project energy requirements, energy use inefficiencies, and/or the energy intensiveness of materials by amount and fuel type for during General Plan buildout, including during construction, operations, maintenance, and/or removal. SCE, the electricity provider to the site, and SoCalGas, the natural gas provider, maintains sufficient capacity to serve the Planning Area. The City of Lake Forest would comply with all existing energy standards, and would not result in significant adverse impacts on energy resources. Furthermore, connections exist between the Planning Area and nearby pedestrian and bicycle pathways, and public transit access exists nearby, reducing the need for local motor vehicle travel. Although improvements to the City's pedestrian, bicycle, and public transit systems would provide further opportunities for alternative transit, the Planning Area would be linked closely with existing networks that, in large part, are sufficient for most residents of the Planning Area and neighboring communities. For the reasons stated above, buildout of the General Plan would not be expected cause an inefficient, wasteful, or unnecessary use of energy resources nor conflict with or obstruct a state or local plan for renewable energy or energy efficiency. This is a **less than significant** impact.

Hazards include man-made or natural materials or man-made or natural conditions that may pose a threat to human health, life, property, or the environment. Hazardous materials and waste present health hazards for humans and the environment. These health hazards can result during the manufacture, transportation, use, or disposal of such materials if not handled properly. In Lake Forest, hazards to humans can also occur from natural or human induced wildfire and air traffic accidents.

This section provides a background discussion of the hazardous materials and waste, fire hazards, and hazards from air traffic found in the City of Lake Forest. This section is organized with an existing setting, regulatory setting, and impact analysis. Additional analysis related to wildfire hazards is contained in Section 3.16 of this EIR.

No comments were received during the NOP comment period regarding this environmental topic.

3.8.1 ENVIRONMENTAL SETTING

HAZARDOUS MATERIALS AND WASTE

Hazardous Materials

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety, or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials.

Hazardous Waste

Hazardous waste is the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including soil or groundwater that is contaminated with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

Transportation of Hazardous Materials

The transportation of hazardous materials within California is subject to various Federal, State, and local regulations. It is illegal to transport explosives or inhalation hazards on any public highway not designated for that purpose, unless the use of the highway is required to permit delivery, or the loading of such materials (California Vehicle Code §§ 31602(b), 32104(a)). The California

Highway Patrol (CHP) designates through routes to be used for the transportation of hazardous materials. Transportation of hazardous materials is restricted to these routes except in cases where additional travel is required from that route to deliver or receive hazardous materials to and from users.

HAZARDOUS SITES

Envirostor Data Management System

The California Department of Toxic Substances Control (DTSC) maintains the *Envirostor Data Management System*, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. This site cleanup information includes: Federal Superfund Sites (NPL), State Response Sites, Voluntary Cleanup Sites, School Cleanup Sites, Corrective Action Sites, Tiered Permit Sites, and Evaluation/Investigation Sites. The hazardous waste facilities include: Permitted–Operating, Post-Closure Permitted, and Historical Non-Operating.

There are 4 locations with a Lake Forest address that are listed in the Envirostor database. One site is listed as a school investigation site with no further action required, and the remaining three sites are voluntary cleanup sites; two of which are active and one that is under local agency oversight with no status listed. Table 3.8-1 lists the location of the voluntary cleanup sites.

TABLE 3.8-1: LAKE FOREST SITE CLEANUP AND HAZARDOUS FACILITIES LIST (ENVIROSTOR)

NAME	*STATUS DATE*	*LOCATION*
Prothero Enterprises Inc. (Orange Tree Plaza Site)	2/27/2013	23512-23532 El Toro Road
Lake Forest Town Center/Dry Cleaner	6/14/2016	22641 Lake Forest Drive
Former Mercury Cleaners	5/28/2019	23804 Mercury Road

SOURCE: CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, ENVIROSTOR DATABASE, 2019.

The Former Mercury Cleaners site is located within the retail center known as Rockfield Showplace, at the southwest corner of the intersection of Mercury Road and Rockfield Boulevard. The former dry-cleaning facility operated from 1981 to 2004 and has not been used as a dry cleaner since. The potential contaminated media at this site is groundwater that has uses other than drinking water, and soil vapor.

The Lake Forest Town Center/ Dry Cleaner is located within a commercial shopping center that was constructed in 1993. A Voluntary Cleanup Agreement (VCA) to investigate and remediate the Site under DTSC oversight was fully executed on August 17, 2016. The potential media affected by contaminants is groundwater that has uses other than drinking water, soil, and soil vapor.

The Prothero Enterprises Inc. site is located within the Orange Tree Plaza shopping center, in a commercial and residential area of Lake Forest. The site has been utilized as a dry-cleaning facility since 1979. Hazardous substances that pose a threat to public health or the environment under an unrestricted land use were detected at the site, specifically in soil and groundwater near the site.

Cortese List

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. DTSC is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. There are no hazardous materials release sites located in the Planning Area.

GeoTracker

GeoTracker is the California Water Resources Control Board's data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense, Site Cleanup Program) as well as permitted facilities such as operating USTs and land disposal sites.

There are 52 locations within Lake Forest (i.e. with a Lake Forest address) that are listed in the GeoTracker database, the majority of which are classified as a leaking underground storage tank (LUST). Several locations have open cases. Table 3.8-2 lists the location of open and closed cases listed on the Geotracker in Lake Forest.

TABLE 3.8-2: LAKE FOREST GEOTRACKER DATABASE SITES

NAME	*SITE TYPE*	*STATUS*
ARCO (20572 Lake Forest)	LUST	Completed – Case Closed
ARCO #3013 (23742 El Toro)	LUST	Open – Site Assessment
Ascension Cemetery (24754 Trabuco)	LUST	Completed – Case Closed
Aspen Cleaners (22851 Lake Forest, Suite B)	Cleanup Program	Completed – Case Closed
Beacon Bay Auto Wash #06 (23602 El Toro)	LUST	Open - Remediation
Because Bay Auto Wash #12 (23581 Rockfield)	LUST	Open – Site Assessment
Because Bay Car Wash (20602 Lake Forest)	LUST	Completed – Case Closed
Cameo Homes (19812 El Toro)	Cleanup Program	Completed – Case Closed
Cameo Homes (19812 El Toro)	LUST	Completed – Case Closed
Chevron USA (23891 Bridger)	LUST	Completed – Case Closed
Chevron (22942 Ridge Route)	LUST	Completed – Case Closed
Chevron (23631 Rockfield)	LUST	Completed – Case Closed
Chevron (20731 Lake Forest)	LUST	Completed – Case Closed
Chevron #9-0884 (22942 Ridge Route)	LUST	Completed – Case Closed
Chevron Service Station #9-0141 (23891 Bridger)	LUST	Completed – Case Closed
Econo Lube N Tune (22861 Lake Forest)	LUST	Completed – Case Closed
El Toro High School (25255 Toledo)	LUST	Completed – Case Closed
El Toro High School (25255 Toledo)	School Site	No Further Action
El Toro Water District (24251 Los Alisos)	LUST	Completed – Case Closed

NAME	*SITE TYPE*	*STATUS*
EXXON (23852 El Toro)	LUST	Completed – Case Closed
EXXON #7-6113 (21762 Lake Forest)	LUST	Completed – Case Closed
Former Crown Cleaners (24601 Raymond Way)	Cleanup Program	Open – Active
J & E Welding (23222 Olive)	LUST	Completed – Case Closed
Kenita Enterprises (24961 Whisler)	LUST	Completed – Case Closed
Lake Forest Town Center/Dry Cleaner (22641 Lake Forest)	Voluntary Cleanup	Active
Los Alisos Water District (22312 Muirlands)	LUST	Completed – Case Closed
Los Alisos Water District (21802 Wisteria)	LUST	Completed – Case Closed
Mercury Cleaners (23804 Mercury)	Cleanup Program	Open - Remediation
MOBIL (21721 Lake Forest)	LUST	Completed – Case Closed
MOBIL #18-170 (22381 El Toro)	LUST	Completed – Case Closed
MOBIL #18-378 (23771 El Toro)	LUST	Open – Site Assessment
MOBIL OIL (23771 El Toro)	LUST	Completed – Case Closed
OC Fire Station #19 (23022 El Toro)	LUST	Completed – Case Closed
OC Fire Station #54 (19811 Pauling)	LUST	Completed – Case Closed
Prothero Enterprises Inc. (23512-23532 El Toro)	Voluntary Cleanup	Refer: Local Agency
Shell Oil (23842 El Toro)	LUST	Completed – Case Closed
Shell Oil (23751 El Toro)	LUST	Completed – Case Closed
Shell Oil (23652 Rockfield)	LUST	Completed – Case Closed
Shell Oil (21762 Lake Forest)	LUST	Completed – Case Closed
Southern California Edison (22641 Lake Forest)	LUST	Completed – Case Closed
Standard Concrete (20851 El Toro)	LUST	Completed – Case Closed
Texaco (23751 El Toro)	LUST	Completed – Case Closed
Texaco (23652 Rockfield)	LUST	Completed – Case Closed
Texaco (23652 Rockfield)	LUST	Completed – Case Closed
The Former Orange Tree Plaza Dry Cleaners (23532 El Toro)	Cleanup Program	Open – Active
The Orchard Shopping Center, Former Silver Cleaners (23684 El Toro)	Cleanup Program	Open – Site Assessment
The Shops at Lake Forest Shopping Center (24312-24422 Rockfield)	Cleanup Program	Open – Remediation – Land Use Restrictions
Unocal (22391 El Toro)	LUST	Completed – Case Closed
Unocal (24201 El Toro)	LUST	Completed – Case Closed
Unocal #6186 (24382 Muirlands)	LUST	Completed – Case Closed
USA Petroleum #825 (23852 El Toro)	LUST	Completed – Case Closed
USA Station #824 (26731 Portola)	LUST	Open – Site Assessment

SOURCE: CALIFORNIA WATER RESOURCES CONTROL BOARD GEOTRACKER

Solid Waste Information System (SWIS)

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the California Integrated Waste Management Board (CIWMB). The SWIS data identifies active, planned and closed sites. The City of Lake Forest has two solid waste facilities listed in the SWIS database. The first facility is the Serrano Creek Ranch Composting Operation (30-AB-0405), an active composting operation located at 25201 Trabuco Road. The second facility is the OC Public Works Portola Yard LVTO (30-AB-0450), an active 'Limited Volume Transfer Operation' facility, located at 20791 El Toro Road. There are no other SWIS solid waste facilities located in Lake Forest.

HAZARDS FROM AIR TRAFFIC

The State Division of Aeronautics has compiled extensive data regarding aircraft accidents around airports in California. This data is much more detailed and specific than data currently available from the FAA and the National Transportation Safety Board (NTSB). According to the California Airport Land Use Planning Handbook (2002), prepared by the State Division of Aeronautics, 18.2% of general aviation accidents occur during takeoff and initial climb and 44.2% of general aviation accidents occur during approach and landing. The State Division of Aeronautics has plotted accidents during these phases at airports across the country and has determined certain theoretical areas of high accident probability.

Approach and Landing Accidents

As nearly half of all general aviation accidents occur in the approach and landing phases of flight, considerable work has been done to determine the approximate probability of such accidents. Nearly 77% of accidents during this phase of flight occur during touchdown onto the runway or during the roll-out. These accidents typically consist of hard or long landings, ground loops (where the aircraft spins out on the ground), departures from the runway surface, etc. These types of accidents are rarely fatal and often do not involve other aircraft or structures. Commonly these accidents occur due to loss of control on the part of the pilot and, to some extent, weather conditions (California Division of Aeronautics, 2002).

The remaining 23% of accidents during the approach and landing phase of flight occur as the aircraft is maneuvered towards the runway for landing, in a portion of the airspace around the airport commonly called the traffic pattern. Common causes of approach accidents include the pilot's misjudging of the rate of descent, poor visibility, unexpected downdrafts, or tall objects beneath the final approach course. Improper use of rudder on an aircraft during the last turn toward the runway can sometimes result in a stall (a cross-control stall) and resultant spin, causing the aircraft to strike the ground directly below the aircraft. The types of events that lead to approach accidents tend to place the accident site fairly close to the extended runway centerline. The probability of accidents increases as the flight path nears the approach end of the runway (California Division of Aeronautics, 2002).

According to aircraft accident plotting provided by the State Division of Aeronautics, most accidents that occur during the approach and landing phase of flight occur on the airport surface

itself. The remainder of accidents that occur during this phase of flight are generally clustered along the extended centerline of the runway, where the aircraft is flying closest to the ground and with the lowest airspeed (California Division of Aeronautics, 2002).

Takeoff and Departure Accidents

According to data collected by the State Division of Aeronautics, nearly 65% of all accidents during the takeoff and departure phase of flight occur during the initial climb phase, immediately after takeoff. This data is correlated by two physical constraints of general aviation aircraft:

- The takeoff and initial climb phase are times when the aircraft engine(s) is under maximum stress and is thus more susceptible to mechanical problems than at other phases of flight; and
- Average general aviation runways are not typically long enough to allow an aircraft that experiences a loss of power shortly after takeoff to land again and stop before the end of the runway.

While the majority of approach and landing accidents occur on or near to the centerline of the runway, accidents that occur during initial climb are more dispersed in their location as pilots are not attempting to get to any one specific point (such as a runway). Additionally, aircraft vary widely in payload, engine power, glide ratio, and several other factors that affect glide distance, handling characteristics after engine loss, and general response to engine failure. This further disperses the accident pattern. However, while the pattern is more dispersed than that seen for approach and landing accidents, the departure pattern is still generally localized in the direction of departure and within proximity of the centerline. This is partially due to the fact that pilots are trained to fly straight ahead and avoid turns when experiencing a loss of power or engine failure. Turning flight causes the aircraft to sink faster and flying straight allows for more time to attempt to fix the problem (California Division of Aeronautics, 2002).

Local Airport Facilities

There are no private or public airport facilities in the Planning Area.

Major Regional Airport Facilities

John Wayne Airport (SNA): SNA is located to the west of the City, in the City of Santa Ana, in the northern part of Orange County. It offers limited international service. The National Plan of Integrated Airport Systems categorizes this airport as a primary commercial service airport, since it has over 10,000 passenger boardings per year.

Long Beach Airport (LGB): LGB is located to the north of the City, in the City of Long Beach. This airport is categorized as a primary commercial service airport by the National Plan of Integrated Airport Systems. FAA records show that the airport had 1,451,404 passengers in 2010.

Los Angeles International Airport (LAX): LAX is owned by the City of Los Angeles. The airport is located in the west of Los Angeles and is, by far, the busiest airport serving the Los Angeles region.

It is the sixth busiest commercial airport in the world and the third busiest in the United States; in 2006, LAX handled over 61 million passengers and 2 million tons of cargo.

Ontario International Airport (ONT): ONT is owned by the City of Ontario and the county of San Bernardino, under a Joint Powers Agreement, as of November 1, 2016. This airport primarily serves the Inland Empire. This airport is located to the east, in the bedroom community of Ontario, California and is the next most prominent airport after LAX.

San Bernardino International Airport (SBD): SBD is in San Bernardino. It is the former Norton Air Force Base. The airport serves the inland empire and is in close proximity to both the Interstate 210 and Interstate 10, and is also in the proximity of historic Route 66.

Bob Hope Airport/Burbank Airport (BUR): BUR is located in Burbank, California, north of downtown Los Angeles. It is limited to a small number of passenger airlines and serves the San Fernando and San Gabriel Valleys. Burbank Airport is the only airport in the Los Angeles area to have a direct rail connection to Downtown Los Angeles. This airport serves the greater Los Angeles area. The FAA shows that this airport had 2,239,804 passenger boardings in 2010.

Other Nearby Airport Facilities

Agua Dulce Airport: A public-use airport located 2 miles east of the central business district of Agua Dulce, Los Angeles County. This airport covers an area of 108 acres and contains one paved runway.

Catalina Airport: A privately owned airport located six miles northwest of the central business district of Avalon, California in the middle of Catalina Island. The airport is open to the public and allows general aviation aircraft to land there.

Compton/Woodley Airport: A Los Angeles County-owned public-use airport located two miles southwest of downtown Compton, in the southern portion of the County. The FAA's National Plan of Integrated Airport Systems has categorized this airport as a reliever airport.

San Gabriel Valley Airport/El Monte Airport: A public airport one mile north of El Monte, in Los Angeles County. This airport has one runway. In November 2014, the airport's name was officially changed from El Monte Airport to San Gabriel Valley Airport.

General William J. Fox Airfield: a Los Angeles County-owned, public airport in Los Angeles County, five miles northwest of Lancaster. Locally known as Fox Field, this airport primarily serves the Antelope Valley. It is categorized by the National Plan of Integrated Airport Systems as a general aviation facility.

Hawthorne Airport: A one-runway airport located one mile east of Hawthorne, Los Angeles County.

Palmdale Airport: An airport owned by the City of Palmdale, located in Palmdale. Palmdale Regional Airport has a small airline terminal and a hangar. The airport terminal is at the southwest

corner of the airport and began civilian operations in 1971. The FAA's Los Angeles Air Route Traffic Control Center is next to the facility.

Santa Monica Airport: A general aviation airport in Santa Monica. The airport is about 2 miles from the Pacific Ocean and 6 miles north of LAX. It is categorized by the FAA's National Plan of Integrated Airport Systems as a reliever airport, and is expected to remain open until 2029.

Van Nuys Airport: A public airport in Van Nuys in the San Fernando Valley section of the City limits of Los Angeles. No major airlines fly into this airport. This airport is owned and operated by Los Angeles World Airports.

Whiteman Airport: A general aviation airport in the northeastern San Fernando Valley community of Pacoima, in Los Angeles. The airport is open to general aviation aircraft 24 hours per day, seven days per week. It is home to over 600 aircraft, a restaurant, and numerous aviation-related businesses.

Zamperini Airfield: A City of Los Angeles-owned public airport located three miles southwest of downtown Torrance, in Los Angeles County. The FAA classifies this airport as a Regional Reliever. This airport was once known as Torrance Municipal Airport.

National Transportation Safety Board Aviation Accident Database

The National Transportation Safety Board Aviation Accident Database identifies a total of 19 aircraft accidents at the John Wayne airport since 1998. The earliest record for an aircraft accident at the John Wayne Airport is July 16, 1982 (nonfatal). The most recent incident is from January 30, 2018 (fatal). The incident prior to this one occurred on December 26, 2017 (nonfatal). Out of the 19 recorded aircraft accidents at the John Wayne airport since 1998, four were fatal accidents causing a total of nine deaths (NTSB, 2018). These incidents were small-scale (primarily prop planes, helicopters, and other small planes) occurring during takeoff and landing from John Wayne Airport. None of these accidents occurred within the City of Lake Forest.

3.8.2 REGULATORY SETTING

FEDERAL

Aviation Act of 1958

The Federal Aviation Act resulted in the creation of the Federal Aviation Administration (FAA). The FAA is charged with the creation and maintenance of a National Airspace System.

Federal Aviation Regulations (CFR, Title 14)

The Federal Aviation Regulation (FAR) establish regulations related to aircraft, aeronautics, and inspection and permitting.

Clean Air Act

The Federal Clean Air Act (FCAA) was first signed into law in 1970. In 1977, and again in 1990, the law was substantially amended. The FCAA is the foundation for a national air pollution control effort, and it is composed of the following basic elements: NAAQS for criteria air pollutants, hazardous air pollutant standards, state attainment plans, motor vehicle emissions standards, stationary source emissions standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

Clean Water Act (CWA)

The CWA, which amended the Water Pollution Control Act (WPCA) of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the U.S. and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the U.S. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of Federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) introduced active Federal involvement to emergency response, site remediation, and spill prevention, most notably the Superfund program. The Act was intended to be comprehensive in encompassing both the prevention of, and response to, uncontrolled hazardous material releases. CERCLA deals with environmental response, providing mechanisms for reacting to emergencies and to chronic hazardous material releases. In addition to establishing procedures to prevent and remedy problems, it establishes a system for compensating appropriate individuals and assigning appropriate liability. It is designed to plan for and respond to failure in other regulatory programs and to remedy problems resulting from action taken before the era of comprehensive regulatory protection.

Environmental Protection Agency

The primary regulator of hazards and hazardous materials is the EPA, whose mission is to protect human health and the environment. The city of Lake Forest is located within EPA Region 9, which includes Arizona, California, Hawaii, and New Mexico.

FY 2001 Appropriations Act

Title IV of the Appropriations Act required the identification of “Urban Wildland Interface Communities in the Vicinity of Federal Lands that are at High Risk from Wildfire” by the U.S. Departments of the Interior and Agriculture.

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act, as amended, is the statute regulating hazardous materials transportation in the United States. The purpose of the law is to provide adequate protection against the risks to life and property inherent in transporting hazardous materials in interstate commerce. This law gives the U.S. Department of Transportation (USDOT) and other

agencies the authority to issue and enforce rules and regulations governing the safe transportation of hazardous materials (DOE 2002).

Natural Gas Pipeline Safety Act

The Natural Gas Pipeline Safety Act authorizes the U.S. Department of Transportation Office of Pipeline Safety to regulate pipeline transportation of natural (flammable, toxic, or corrosive) gas and other gases as well as the transportation and storage of liquefied natural gas. The Office of Pipeline Safety regulates the design, construction, inspection, testing, operation, and maintenance of pipeline facilities. While the Federal government is primarily responsible for developing, issuing, and enforcing pipeline safety regulations, the pipeline safety statutes provide for State assumption of the intrastate regulatory, inspection, and enforcement responsibilities under an annual certification. To qualify for certification, a state must adopt the minimum Federal regulations and may adopt additional or more stringent regulations as long as they are not incompatible.

Resource Conservation and Recovery Act (RCRA)

This act established EPA's "cradle to grave" control (generation, transportation, treatment, storage and disposal) over hazardous materials and wastes. In California, the Department of Toxic Substances Control (DTSC) has RCRA authorization.

STATE

Aeronautics Act (Public Utilities Code §21001)

The Caltrans Division of Aeronautics bases the majority of its aviation policies on the Aeronautics Act. Policies include permits and annual inspections for public airports and hospital heliports and recommendations for schools proposed within two miles of airport runways.

Airport Land Use Commission Law (Public Utilities Code §21670 et seq.)

The law, passed in 1967, authorized the creation of Airport Land Use Commissions (ALUC) in California. Per the Public Utilities Code, the purpose of an ALUC is to protect *public health, safety, and welfare by encouraging orderly expansion of airports and the adoption of land use measures that minimizes exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses* (Pub. Util. Code §21670). Furthermore, each ALUC must prepare an Airport Land Use Compatibility Plan (ALUCP). Each ALUCP, which must be based on a twenty-year planning horizon, should focus on broadly defined noise and safety impacts.

Assembly Bill 337

Per AB 337, local fire prevention authorities and the California Department of Forestry and Fire Protection (CalFire) are required to identify Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas (LRA). Standards related to brush clearance and the use of fire resistant materials in fire hazard severity zones are also established.

California Code of Regulations

Title 3 of the CCR pertains to the application of pesticides and related chemicals. Parties applying regulated substances must continuously evaluate application equipment, the weather, the treated lands and all surrounding properties. Title 3 prohibits any application that would:

- Contaminate persons not involved in the application;
- Damage non-target crops or animals or any other public or private property; and
- Contaminate public or private property or create health hazards on said property.

Title 8 of the CCR establishes California Occupational Safety and Health Administration (Cal OSHA) requirements related to public and worker protection. Topics addressed in Title 8 include materials exposure limits, equipment requirements, protective clothing, hazardous materials, and accident prevention. Construction safety and exposure standards for lead and asbestos are set forth in Title 8.

Title 14 of the CCR establishes minimum standards for solid waste handling and disposal.

Title 17 of the CCR establishes regulations relating to the use and disturbance of materials containing naturally occurring asbestos.

Title 19 of the CCR establishes a variety of emergency fire response, fire prevention, and construction and construction materials standards.

Title 22 of the CCR sets forth definitions of hazardous waste and special waste. The section also identifies hazardous waste criteria and establishes regulations pertaining to the storage, transport, and disposal of hazardous waste.

Title 26 of the CCR is a medley of State regulations pertaining to hazardous materials and waste that are presented in other regulatory sections. Title 26 mandates specific management criteria related to hazardous materials identification, packaging, and disposal. In addition, Title 26 establishes requirements for hazardous materials transport, containment, treatment, and disposal. Finally, staff training standards are set forth in Title 26.

Title 27 of the CCR sets forth a variety of regulations relating to the construction, operation, and maintenance of the state's landfills. The title establishes a landfill classification system and categories of waste. Each class of landfill is constructed to contain specific types of waste (household, inert, special, and hazardous).

California Department of Transportation

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 2011). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

California Government Code Section 65302

This section, which establishes standards for developing and updating General Plans, includes fire hazard assessment and Safety Element content requirements.

California Health and Safety Code

Division 11 of the Health and Safety Code establishes regulations related to a variety of explosive substances and devices, including high explosives and fireworks. Section 12000 et seq. establishes regulations related to explosives and explosive devices, including permitting, handling, storage, and transport (in quantities greater than 1,000 pounds).

Division 12 establishes requirements for buildings used by the public, including essential services buildings, earthquake hazard mitigation technologies, school buildings, and postsecondary buildings.

Division 20 establishes DTSC authority and sets forth hazardous waste and underground storage tank regulations. In addition, the division creates a State superfund framework that mirrors the Federal program.

Division 26 establishes California Air Resources Board (CARB) authority. The division designates CARB as the air pollution control agency per Federal regulations and charges the Board with meeting Clean Air Act requirements.

California Health and Safety Code and UBC Section 13000 et seq.

State fire regulations are set forth in §13000 *et seq*. of the California Health and Safety Code, which is divided into "Fires and Fire Protection" and "Buildings Used by the Public." The regulations provide for the enforcement of the UBC and mandate the abatement of fire hazards.

The code establishes broadly applicable regulations, such as standards for buildings and fire protection devices, in addition to regulations for specific land uses, such as childcare facilities and high-rise structures.

California Vehicle Code §31600 (Transportation of Explosives)

This code establishes requirements related to the transportation of explosives in quantities greater than 1,000 pounds, including licensing and route identification.

California Public Resources Code

The State's Fire Safety Regulations are set forth in Public Resources Code §4290, which include the establishment of State Responsibility Areas (SRA).

Public Resources Code §4291 sets forth defensible space requirements, which are applicable to anyone who "*…owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material"* (§4291(a)).

Food and Agriculture Code

Division 6 of the California Food and Agriculture Code (FAC) establishes pesticide application regulations. The division establishes training standards for pilots conducting aerial applications as well as permitting and certification requirements.

State Oversight of Hazards and Hazardous Materials

The DTSC is chiefly responsible for regulating the handling, use, and disposal of toxic materials. The State Water Resources Control Board (SWRCB) regulates discharge of potentially hazardous materials to waterways and aquifers and administers the basin plans for groundwater resources in the various regions of the state. The Regional Water Quality Control Board (RWQCB) oversees surface and groundwater. Programs intended to protect workers from exposure to hazardous materials and from accidental upset are covered under OSHA at the Federal and California Division of Occupational Safety and Health (Cal/OSHA) and the California Department of Health Services (DHS) at the state level. Air quality is regulated through the CARB and South Coast Air Quality Management District. The State Fire Marshal is responsible for the protection of life and property through the development and application of fire prevention engineering, education, and enforcement; CalFIRE provides fire protection services for State and privately-owned wildlands.

Water Code

Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Water Quality Control Act, created the SWRCB and the RWQCB. In addition, water quality responsibilities are established for the SWRCB and RWQCBs.

LOCAL

City of Lake Forest Municipal Code

The City of Lake Forest Municipal Code is the primary tool that regulates development in the City. Section 2.20.080 describes the responsibilities of the Lake Forest Disaster Council, which include developing the City of Lake Forest Emergency Plan. Additionally, Chapter 6 of the Municipal Code provides requirements for dealing with hazardous materials, including hazardous waste. Municipal Code provisions for protection from fire and flood hazards are identified elsewhere within this chapter.

Title 6- Health and Sanitation (6.16 Hazardous Materials); this section discusses hazardous materials including disclosure to the Orange County Fire Department.

Title 7 – Subdivisions (7.08.145 Fire Protection); this section discusses the requirements for subdivisions in high or extremely high hazard areas including providing appropriate fire protection by means of fire breaks, fuel modification programs, access roads, sufficient water supply, landscaping, and open spaces.

Title 8- Buildings and Construction (8.24 Fire Code); this section includes the adoption of the 2016 California Fire code and the adoption of additional amendments; the City will adopt the 2019 code in late 2019, which will become effective January 1, 2020.

Title 9- Planning and Zoning (9.144.070.7 Public display of fireworks); this section covers public firework displays including requiring permits from the Orange County Fire Authority or Fire Chief.

Title 11- Peace and Safety (11.56 Fire Alarm Systems); this section covers regulations relating to fire alarm systems.

City of Lake Forest Local Guidelines for Implementing the California Environmental Quality Act

In 2017, the City of Lake Forest adopted procedures to implement the California Environmental Quality Act ("CEQA"), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines ("State CEQA Guidelines"), 14 California Code of Regulations Section 15000 et seq. The procedures established herein implement and tailor the general provisions of the State CEQA Guidelines to the specific operations of the City of Lake Forest ("City"). These Local Guidelines are intended to supplement the State CEQA Guidelines" (City of Lake Forest 2017).

Section 2 (d) specifically identifies development of hazardous waste sites:

D) PROJECTS RELATING TO DEVELOPMENT OF HAZARDOUS WASTE AND OTHER SITES

An applicant for a development project must submit a signed statement to the City stating whether the project and any alternatives are located on a site which is included in any list compiled by the Secretary for Environmental Protection of the California Environmental Protection Agency ("California EPA") listing hazardous waste sites and other specified sites located in the City's boundaries. The applicant's statement must contain the following information:

(1) The applicant's name, address, and phone number. (2) Address of site, and local agency (city/county). (3) Assessor's book, page, and parcel number. (4) The list which includes the site, identification number, and date of list.

Before accepting as complete an application for any development project, the City shall consult lists compiled by the Secretary for Environmental Protection of the California EPA pursuant to Government Code Section 65962.5 listing hazardous waste sites and other specified sites located in the City's boundaries. When acting as Lead Agency, the City shall notify an applicant for a development project if the project site is located on such a list and not already identified. In the Notice of Intent to Adopt a Negative Declaration or Mitigated Negative Declaration (see Guidelines Section 6)d) or the Notice of Preparation of DEIR (see Guidelines Section 7)e)) the City shall specify the California EPA list, if any, which includes the project site, and shall provide the information contained in the applicant's statement.

El Toro Marine Corps Air Station

Established in 1942, the El Toro Marine Corps Air Station occupied 4,700 acres of land adjacent to what would later become the City of Lake Forest. Until its decommissioning in 1999, the base was the largest Marine air station on the West Coast, channeling hundreds of aircraft through a flight path directly over the City. In the shadow of the flight path and exposed to safety hazards and noise, more than 800 acres of City land was restricted to non-residential development. Then in 1993, the closure of the base was announced by the Federal Government, and a debate ensued over how the site should be repurposed. In the end, voters turned down the idea of building an international airport on the site which led the way to the City being able to discuss new ideas, including building housing. The City conducted a comprehensive "Opportunities Study" and rezoned of a number of parcels to allow for a broader range of uses. Although the El Toro Marine Corps Air Station is now closed, its impact continues to be felt on the development and history of the City of Lake Forest.

3.8.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact from hazards and hazardous materials if it will:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

IMPACTS AND MITIGATION MEASURES

Impact 3.8-1: General Plan implementation has the potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (Less than Significant)

Future development, infrastructure, and other projects allowed under the General Plan may involve the transportation, use, and/or disposal of hazardous materials. Hazardous materials are typically used in industrial, and commercial uses, as well as residential uses. Future uses may involve the transport and disposal of such materials from time to time. Future activities may involve equipment or construction activities that use hazardous materials (e.g., coatings, solvents and fuels, and diesel-fueled equipment), cleanup of sites with known hazardous materials, the transportation of excavated soil and/or groundwater containing contaminants from areas that are identified as being contaminated, or disposal of contaminated materials at an approved disposal site. While hazardous materials may be associated with industrial activities, hazardous materials may also be associated with the regular cleaning and maintenance of residential and other less intense uses. Accidental release of hazardous materials that are used in the construction or operation of a project may occur. There is also the potential for accidental release of pre-existing hazardous materials, associated with previous activities on a site. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

The use, transportation, and disposal of hazardous materials is regulated and monitored by local fire departments, Certified Unified Program Agencies (CUPAs), the Cal OSHA and the DTSC consistent with the requirements of Federal, State, and local regulations and policies. Facilities that store hazardous materials on-site are required to maintain a Hazardous Materials Business Plan in accordance with State regulations. In the event of an accidental release of hazardous materials, the local CUPA and emergency management agencies (e.g., Police and Fire) would respond. All future projects allowed under the General Plan would be required to comply with the provisions of Federal, State, and local requirements related to hazardous materials. As future development and infrastructure projects are considered by the City, each project would be evaluated for potential impacts, specific to the project, associated with hazardous materials as required under CEQA.

In addition to the requirements associated with Federal and State regulations and the Municipal Code, the General Plan includes policies and actions to address potential impacts associated with hazardous materials among other issues. These policies and actions in the General Plan would ensure that potential hazards are identified on a project site, that development is located in areas where potential exposure to hazards and hazardous materials can be mitigated to an acceptable level, and that business operations comply with Federal and State regulations regarding the use, transport, storage, and disposal of hazardous materials. The General Plan also includes policies and

actions to ensure that the City has adequate emergency response plans and measures to respond in the event of an accidental release of a hazardous substance.

As described previously in the regulatory setting, hazardous materials regulations related to the use, handling, and transport of hazardous materials are codified in Titles 8, 22, and 26 of the CCR, and their enabling legislation set forth in Chapter 6.95 of the California Health and Safety Code. These laws were established at the state level to ensure compliance with federal regulations to reduce the risk to human health and the environment from the routine use of hazardous substances. These regulations must be implemented by employers/businesses, as appropriate, and are monitored by the state (e.g., Cal OSHA in the workplace or DTSC for hazardous waste) and/or the County. The haulers and users of hazardous materials are listed with the Orange County Fire Authority and are regulated and monitored by the County of Orange. Implementation of Title 49, Parts 171-180, of the Code of Federal Regulations would reduce any impacts associated with the potential for accidental release of hazardous materials. Therefore, implementation of the General Plan policies and actions listed below, as well as Federal and State regulations, would ensure that potential impacts associated with the routine use, transport, storage, or disposal or accidental release of hazardous materials would be reduced to **less than significant** level.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-4.1: Regulations. Ensure that the Orange County Fire Authority continues to enforce the Uniform Fire Code relating to the use of hazardous material and ensure that appropriate regulations are followed and precautions are taken for the type and amount of hazard being created.

PS-4.2: Cleanup Sites. Require that developers coordinate with the Orange County Health Care Agency to confirm that hazardous waste cleanup sites located within the City are remediated in a manner that keeps the public safe.

PS-4.3: County Plans. Utilize the Orange County Hazardous Waste Management Plan to ensure that local regulation and practices are consistent with the policy direction and action programs that the County recommends.

PS-4.4: Proposed Facilities. Require appropriate environmental analysis to be conducted for any proposed hazardous waste materials treatment or transfer, in accordance with environmental review requirements.

PS-4.5: Emergency Response. Work with the Orange County Fire Authority and other responding agencies to ensure that emergency personnel respond safely and effectively to a hazardous materials incident in the city.

PS-4.6: Public Education. Coordinate with the City's waste service provider(s) and the County of Orange to increase public awareness about proper disposal related to household hazardous waste and inform the Lake Forest community regarding relevant services and programs to address issues related to hazardous waste and materials.

PS-5.2: Emergency Preparedness Plans. Maintain an updated Emergency Operations Plan specific to Lake Forest.

PF-8.3: Department Consultation. Promote coordination between the City of Lake Forest and Police and Fire services during the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.

ACTIONS

PS-4a: As part of the development review process, require projects that may result in significant risks associated with hazardous materials to include measures to address the risks and reduce the risks to an acceptable level.

PS-4b: Continue to require the submittal of information regarding hazardous materials manufacturing, storage, use, transport, and/or disposal by existing and proposed businesses and developments to the Orange County Fire Authority.

Impact 3.8-2: General Plan implementation has the potential to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school (Less than Significant)

The City of Lake Forest is served by the Saddleback Valley Unified School District as well as several parochial schools. Table 3.8-3 provides a summary of the schools serving the City's population.

TABLE 3.8-3: PUBLIC SCHOOLS SERVING LAKE FOREST

SCHOOL	*GRADES SERVED*	*ADDRESS*	*ENROLLMENT (2016-2017 SCHOOL YEAR)*	*AVERAGE CLASS SIZE*
ELEMENTARY SCHOOLS				
Foothill Ranch Elementary	K-6	1 Torino Drive	1,133	29.15
La Madera	K-6	25350 Serrano Road	626	27.26
Lake Forest	K-6	21801 Pittsford Drive	894	25
Olivewood Elementary	--	23391 Dune Mear Road	490	28.28
Ralph A. Gates Elementary	K-6	23882 Landisview Avenue	1,059	30.21
Rancho Canada Elementary	K-6	21801 Winding Way	696	26.81
Santiago Elementary	K-6	24982 Rivendell Drive	414	26.43
MIDDLE SCHOOLS				
Serrano Intermediate	7-8	24642 Jeronimo Road	1,233	30.38
PUBLIC HIGHSCHOOL & PAROCHIAL SCHOOLS				
El Toro High (Public)	9-12	25255 Toledo Way	2,548	29.29
Grace Christian	PK-6	26052 Trabuco Road	480	Pre-K: <12 Elem: <20
Heritage Christian	7-12	23302 El Toro Road	196	22
Lake Forest Montessori	PK-1	2535 Trabuco Rd Ste 5	87	13
Arbor Christian	PK-6	23302 El Toro Road	81	<12
Abiding Savior Lutheran	PK-8	23262 El Toro Road	360	<25

SOURCES: GREAT SCHOOLS, SCHOOL PROFILES, AUGUST 2018, GREATSCHOOLS.ORG. PRIVATE SCHOOL REVIEW. HTTPS://WWW.PRIVATESCHOOLREVIEW.COM

The General Plan Land Use Element includes land use designations, but does not propose actual development projects, or businesses. As such, it is not possible to determine if a specific use will result in hazardous emissions or require handling of hazardous or acutely hazardous materials, substances, or waste. The land use designations with the highest possibility of having businesses that result in hazardous emissions or require handling of hazardous or acutely hazardous materials, substances, or waste would be commercial, and light industrial uses. Some of these uses would likely occur within ¼ mile of an existing school. Each of these uses may use a variety of hazardous materials commonly found in urban areas including: paints, cleaners, and cleaning solvents. If handled appropriately, these materials do not pose a significant risk. The Commercial land use designation generally provides for a variety of retail, professional office, medical, service-oriented business activities, and hospitality facilities that with adequate setback requirements are generally compatible with surrounding urban development. The Light Industrial designation

provides for a variety of light industrial uses that as indicated in the land use description are to be nonpolluting and which can co-exist with surrounding land uses and which do not in their maintenance, assembly, manufacturing or operations create smoke, gas, dust, sound, vibration, soot or glare to any degree which might be obnoxious or offensive to persons residing or conducting business in the city.

The proposed General Plan is not anticipated to directly lead to the establishment of new businesses that would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste because the General Plan does not approve any specific development project. However, given the unknown nature of future business establishments within the commercial and industrial use areas, the potential for hazardous materials is present. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

Nevertheless, all hazardous materials would be required to be handled in accordance with Federal, State, and County requirements, which would limit the potential for a project to expose nearby uses, including schools, to hazardous emissions or an accidental release. Hazardous emissions are monitored by the SCAQMD, RWQCB, DTSC and the local CUPA. In the event of a hazardous materials spill or release, notification and cleanup operations would be performed in compliance with applicable Federal, State, and local regulations and policies, including hazard mitigation plans. As part of the development review process, the City's proposed General Plan also requires projects that may result in significant risks associated with hazardous materials to include measures to address and reduce the risks to an acceptable level such that surrounding uses are not exposed to hazardous materials in excess of adopted state and federal standards, and also requires the submittal of information regarding hazardous materials manufacturing, storage, use, transport, and/or disposal by existing and proposed businesses and developments to the Orange County Fire Authority. Compliance with all existing regulations as well as General Plan policies and actions related to land use compatibility and hazardous materials would ensure that the impact is **less than significant**.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

<u>LU-2.1 Physical Characteristic Compatibility</u>. Ensure that new development fits within the existing community setting and is compatible with surrounding land uses and public infrastructure availability.

<u>PF-8.3 Department Consultation</u>. Promote coordination between the City of Lake Forest and Police and Fire services during the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.

<u>PS-4.1 Regulations</u>. Ensure that the Orange County Fire Authority continues to enforce the Uniform Fire Code relating to the use of hazardous material and ensure that appropriate regulations are followed and precautions are taken for the type and amount of hazard being created.

PS-4.3 County Plans. Utilize the Orange County Hazardous Waste Management Plan to ensure that local regulation and practices are consistent with the policy direction and action programs that the County recommends.

PS-4.4 Proposed Facilities. Require appropriate environmental analysis to be conducted for any proposed hazardous waste materials treatment or transfer, in accordance with environmental review requirements.

ACTIONS

PS-4a: As part of the development review process, require projects that may result in significant risks associated with hazardous materials to include measures to address the risks and reduce the risks to an acceptable level.

PS-4b: Continue to require the submittal of information regarding hazardous materials manufacturing, storage, use, transport, and/or disposal by existing and proposed businesses and developments to the Orange County Fire Authority.

Impact 3.8-3: General Plan implementation has the potential to have projects located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Less than Significant)

There are no hazardous materials release sites compiled pursuant to Government Code Section 65962.5 located in the Planning Area.

There are three locations with a Lake Forest address that are listed in the Envirostor database. The first location is located at 23512-23532 El Toro Road. The site was the historical location of Prothero Enterprises, a dry-cleaning facility (since 1979). The potential contaminants of concern include tetrachloroethylene (PCE) and trichloroethylene (TCE); the cleanup status states to "refer to local agency" (as of 2/27/2013). This is a voluntary cleanup site and Orange County is currently responsible for oversight of this investigation. Indoor air and soil vapor are potentially affected.

The second location within Lake Forest listed in the Envirostor database is located at 22641 Lake Forest Drive. The site was also the historical location of a dry cleaner. The potential contaminants of concern include tetrachloroethylene (PCE) and trichloroethylene (TCE); the cleanup status is active as of June 14, 2016. This is a voluntary cleanup site. Soil, soil vapor, and groundwater are potentially affected. A Voluntary Cleanup Agreement (VCA) to investigate and remediate the Site under DTSC oversight was fully executed on August 17, 2016. On June 30, 2017, DTSC approved a workplan for investigation activities which, focusing on the dry-cleaning facility, proposed soil and soil vapor sampling and a vapor intrusion assessment (sub-slab and indoor air sampling). Fieldwork activities were completed in early April 2018.

The third location within Lake Forest listed in the Envirostor database is 25255 Toledo Way. The site contains El Toro High School since 1974. The site was the historical location of agriculture with

row crops. The potential contaminants of concern include polychlorinated biphenyls (PCBS) and TPH-Diesel; the cleanup status is "no further action" as of November 20, 2000.

There are 52 locations within Lake Forest (i.e. with a Lake Forest address) that are listed in the GeoTracker database. Several locations have open cases as shown previously in Table 3.8-2.

The City of Lake Forest has two solid waste facilities listed in the SWIS database. The first facility is the Serrano Creek Ranch Composting Operation (30-AB-0405), an active composting operation located at 25201 Trabuco Road. The second facility is the OC Public Works Portola Yard LVTO (30-AB-0450), an active 'Limited Volume Transfer Operation' facility, located at 20791 El Toro Road. There are no other SWIS solid waste facilities located in Lake Forest.

The above-mentioned sites are subject to various Federal and State laws and regulatory agencies, including the CERCLA, EPA, DTSC, and RWQCB. Development allowed by the General Plan could create a hazard to the public or the environment through a disturbance or release of contaminated materials if the development occurs on or adjacent to contaminated sites without appropriate measures to contain or mitigate the existing contamination. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

Federal and State regulations ensure that existing hazards, including those associated with known hazardous materials sites, are addressed prior to development.

Additionally, as described in the regulatory setting, the City of Lake Forest has adopted "Local Guidelines for Implementing the California Environmental Quality Act" and Section 2 (d) specifically identifies Development on potential hazardous waste sites and states:

> *An applicant for a development project must submit a signed statement to the City stating whether the project and any alternatives are located on a site which is included in any list compiled by the Secretary for Environmental Protection of the California Environmental Protection Agency ("California EPA") listing hazardous waste sites and other specified sites located in the City's boundaries. The applicant's statement must contain the following information:*
>
> *(1) The applicant's name, address, and phone number. (2) Address of site, and local agency (city/county). (3) Assessor's book, page, and parcel number. (4) The list which includes the site, identification number, and date of list.*

Before accepting as complete an application for any development project, the Local Guidelines for Implementing the California Environmental Quality Act Section states that the City shall consult lists compiled by the Secretary for Environmental Protection of the California EPA pursuant to Government Code Section 65962.5 listing hazardous waste sites and other specified sites located in the City's boundaries. When acting as Lead Agency, the City shall notify an applicant for a development project if the project site is located on such a list and not already identified.

The General Plan includes policies that are intended to ensure cleanup sites are identified, reviewed, and if needed, remediated, to prevent inappropriate release of hazardous materials. Additionally, compliance with Federal and State regulations and review requirements included in the City's "*Local Guidelines for Implementing the California Environmental Quality Act*" would ensure that potential impacts associated with the hazardous conditions on sites listed pursuant to Government Code Section 65962.5 would be **less than significant**.

GENERAL PLAN POLICIES THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-4.2: Cleanup Sites. Coordinate with the Environmental Health Division of the County of Orange agency to confirm that hazardous waste cleanup sites located within the City are remediated by the property owner in a manner that keeps the public safe.

PS-4.4: Proposed Facilities. Require appropriate environmental analysis to be conducted for any proposed hazardous waste materials treatment or transfer, in accordance with environmental review requirements.

Impact 3.8-4: General Plan implementation is not located within an airport land use plan, two miles of a public airport or public use airport, and would not result in a safety hazard for people residing or working in the project area (Less than Significant)

Hazards related to airports are typically grouped into two categories: air hazards and ground hazards. Air hazards jeopardize the safety of an airborne aircraft and expose passengers, pilots, and crews to danger. Examples of air hazards include tall structures, glare-producing objects, bird and wildlife attractants, radio waves from communication centers, or other features that have the potential to interfere with take-off or landing procedures, posing a risk to aircraft. Ground hazards jeopardize the safety of current and future residents and/or workers in the vicinity of an airport. The most obvious ground hazard is a crash, which may produce a serious, immediate risk to those residing in or using areas adjacent to the airport. Most accidents occur during take-off and landing. Therefore, the higher the density around an airport, including transportation facilities, the higher the risk associated with this type of hazard.

Established in 1942, the El Toro Marine Corps Air Station occupied 4,700 acres of land adjacent to what would later become the City of Lake Forest. Until its decommissioning in 1999, the base was the largest Marine air station on the West Coast, channeling hundreds of aircraft through a flight path directly over the City. In the shadow of the flight path and exposed to safety hazards and noise, more than 800 acres of City land was restricted to non-residential development. Then in 1993, the closure of the base was announced by the Federal Government, and a debate ensued over how the site should be repurposed. In the end, voters turned down the idea of building an international airport on the site. There are no airport facilities located within the Planning Area.

The nearest airport facility within the vicinity of the Planning Area is the John Wayne Airport (SNA): SNA is located to the west of the City, in the City of Santa Ana, in the northern part of Orange

County. It offers limited international service. The National Plan of Integrated Airport Systems categorizes this airport as a primary commercial service airport, since it has over 10,000 passenger boarding's per year.

Lake Forest does not lie within the Runway Protection Zone, Inner/Outer Safety Zones, Inner Turning Zone, Sideline Safety Zone, or Traffic Pattern Zone for this airport. None of the Planning Area lies within the land use compatibility zones for nearby airports.

The National Transportation Safety Board Aviation Accident Database identifies a total of 19 aircraft accidents at the John Wayne airport since 1998. The earliest record for an aircraft accident at the John Wayne Airport is July 16, 1982 (nonfatal). The most recent incident is from January 30, 2018 (fatal). The incident prior to this one occurred on December 26, 2017 (nonfatal). Out of the 19 recorded aircraft accidents at the John Wayne airport since 1998, four were fatal accidents causing a total of nine deaths (NTSB, 2018). These incidents were small-scale (primarily prop planes, helicopters, and other small planes) occurring during takeoff and landing from John Wayne Airport. None of these accidents occurred within the City of Lake Forest.

In relation to airplane noise General Plan Policy PS-6.10 states that the City will maintain communication with John Wayne Airport and other relevant air transportation agencies to ensure that all future plans have limited impacts to the community of Lake Forest. However, the General Plan does not include any policies or actions that would impact air hazards or safety. Implementation of the General Plan would have a **less than significant** impact with regard to this issue and no mitigation is required.

Impact 3.8-5: General Plan implementation has the potential to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (Less than Significant)

The General Plan would allow a variety of new development, including residential, commercial, industrial, and public projects, which would result in increased jobs and population in Lake Forest. Road and infrastructure improvements would occur to accommodate the new growth. Future development and infrastructure projects are not anticipated to remove or impede any established evacuation routes within the City. Furthermore, the General Plan does not include land uses, policies, or other components that conflict with adopted emergency response or evacuation plans. However, given that the type, location, and size of future development and infrastructure projects is not known at this time, there is the potential that the City could receive a development proposal that could potentially interfere with an established emergency evacuation route or plan. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

The City is a member of the Orange County Operation Area and the Orange County Emergency Management Organization. Both of these entities provide mutual aid to communities via the Orange County Sheriff's Department, Orange County Fire Authority and the State of California Office of Emergency Services.

The General Plan ensures that the City's emergency access routes, emergency contact lists, and public information regarding designated facilities and routes are regularly reviewed to ensure that up to date information is available to the City and the public in the event of an emergency. Important new critical facilities would be located to ensure resiliency in the event of a natural disaster. Implementation of the General Plan policies and actions listed below would reduce this potential impact to a **less than significant** level.

GENERAL PLAN POLICIES AND ACTION THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-4.5: Emergency Response. Work with the Orange County Fire Authority and other responding agencies to ensure that emergency personnel respond safely and effectively to a hazardous materials incident in the city.

PS-5.1: Critical Facilities. Coordinate with service providers to ensure the resilience of critical facilities, lifeline services, and infrastructure, and plan for the use of critical facilities during post-disaster response and recovery.

PS-5.2: Emergency Preparedness Plans. Maintain an updated Emergency Operations Plan specific to Lake Forest.

PS-5.3: Local Coordination. Coordinate with local key stakeholders (officials, schools, businesses, and organizations) within the community to make them aware of their role in the emergency plan and the necessary requirements in case of emergency.

PS-5.4: Automatic and Mutual Aid. Continue to participate in automatic and mutual aid agreements with adjacent service providers to ensure efficient and adequate resources, facilities, and support services during and after emergencies.

PS-5.5: Communications. Evaluate the potential to utilize a comprehensive emergency communication system that allows for efficient connection in case of emergency.

PS-5.6: Emergency Evacuation Routes and Access. Work with the Orange County Fire Authority and the Orange County Sherriff's Department to maintain, update, and regularly exercise emergency access, protocols, and evacuation routes to assess their effectiveness.

PS-5.7: Emergency Shelters. Periodically coordinate with emergency shelter providers to ensure that necessary equipment supplies are available in case of emergency.

PS-5.8: Community Training Programs. Continue to support community-based emergency training programs as a valuable asset to the community.

PS-5.9: Public Awareness. Prepare residents for emergency situations by making emergency strategies, including evacuation routes, publicly-known and easily accessible.

PS-5.10: School Safety. Coordinate with local schools related to their programs and practices regarding emergency preparedness.

ACTION

PF-8a: The Orange County Fire Authority and City Engineer will review proposed development projects and street networks to evaluate the accessibility for fire engines and other emergency response functions.

Impact 3.8-6: General Plan implementation has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires (Significant and Unavoidable)

Wildfires are a potential hazard to development and land uses located in the foothill and forested areas of the city. The severity of wildfire problems depends on a combination of vegetation, climate, slope, and people. The vegetation and topography found in the eastern portions of the Planning Area, coupled with hot, dry summers, present fire hazards during critical fire periods for much of the county. In addition to natural factors such as lightning, human activity is a primary factor contributing to the incidence of wildfires. Campfires, smoking, debris burning, arson, public utility infrastructure, and equipment use are common human-related causes of wildfires.

As shown in Figure 3.8-1, Local Responsibility Areas (LRA) are concentrated in the incorporated areas of Lake Forest. The eastern portions of the city are categorized as a "Very High" FHSZ by CalFire. State Responsibility Areas just outside the Planning Area are found to the east in the hilly terrain of the Foothills. Specifically, this includes the areas that are outside the city limits. The hilly terrain in this State Responsibility Area is categorized as a "High" FHSZ.

Fire threat determinations is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes. As shown on Figure 3.8-2, most of the area within Lake Forest northeast of Trabuco Road is in an area that is considered either very high or extremely high Fire Threat to People while areas to the southwest are generally considered to have a moderate threat to people.

Development under the General Plan would allow development to place people and/or structures in currently developed areas that are identified as having a significant risk of wildland fires. All future projects allowed under the General Plan would be required to comply with the provisions of Federal, State, and local requirements related to wildland fire hazards, including State fire safety regulations associated with wildland-urban interfaces, fire-safe building standards, and defensible space requirements. As future development and infrastructure projects are considered by the City, each project would be evaluated for potential impacts, specific to the project, associated with wildland fire hazards as required under CEQA. This is considered a significant impact.

City of Lake Forest Municipal Code Title 7 – Subdivisions (7.08.145 Fire Protection) discusses the requirements for subdivisions in high or extremely high hazard areas including providing appropriate fire protection by means of fire breaks, fuel modification programs, access roads,

sufficient water supply, landscaping, and open spaces. Title 8- Buildings and Construction (8.24 Fire Code) includes the adoption of the 2016 California Fire code (soon to be the 2019 California Fire code) and the adoption of additional amendments. Title 11- Peace and Safety (11.56 Fire Alarm Systems) covers regulations relating to fire alarm systems. Additionally, development allowed under the General Plan would also be required to comply with OCFA VHFSHZ guidelines, which ensures that development design will comply with the applicable provisions of the Uniform Fire Code (UFC) as well as locally adopted ordinances enforced by the OCFA.

The General Plan includes requirements for adequate water supply and water flow availability, ensuring adequate emergency access, adequate fire protection services, fire safe design site standards, and ensuring public awareness regarding fire safety. However, even with the aforementioned policies regulations and standards, given that existing and limited future development in Lake Forest would be allowed in areas identified as having a very high risk of wildfire, there will always be a risk of loss of life and property as a result of wildland fires within populated areas of the City. Therefore, impacts related to this topic would remain **significant and unavoidable**.

Implementation of the General Plan policies and actions listed below, combined with local and state requirements discussed previously, would ensure that potential wildland fire hazards to people and structures is mitigated to the greatest extent feasible. However, the City cannot state with certainty that this impact would be reduced to a less than significant level. There is no additional feasible mitigation available that would reduce this potential impact to a less than significant level.

GENERAL PLAN POLICIES AND ACTION THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-2.1: Building Fire Codes. Require that all buildings and facilities within Lake Forest comply with local, state, and federal regulatory standards such as the California Building and Fire Codes as well as other applicable fire safety standards.

PS-2.2: Fire Protection Services. Coordinate with the Orange County Fire Authority and CalFire as it protects the safety and security of the Lake Forest community.

PS-2.3: Fire Hazard Identification. Maintain and regularly update the City's fire hazard overlay map for changes in fire hazard severity districts consistent with changes in hazard designations by CAL FIRE.

PS-2.4: Very High Fire Hazard Zone. Require that all development in Very High Fire Hazard Zones meet Very High Fire Hazard Zone standards as designated by City Ordinance.

PS-2.5: Urban Fire Risks. Work with the City's fire service provider to maintain an ongoing fire inspection program to reduce fire hazards associated with multifamily development, critical facilities, public assembly facilities, industrial buildings, and nonresidential buildings.

PS-2.6: Grant Funding. Seek grant funding, on our own and in collaboration with regional partners, to mitigate potential wildfire threats to the community and to implement special training workshops and projects related to defensible space and fuel reduction practices.

PS-2.7: Regional Coordination. Coordinate with Orange County, neighboring cities, and other fire protection agencies to reduce the potential for wildfire hazards in the Saddleback Valley.

PS-2.8: Interagency Support. Participate in the mutual aid system and automatic aid agreements to back up and supplement capabilities to respond to emergencies.

PS-2.9: Educational Programs. Work with the Orange County Fire Authority to disseminate educational programs on fire safety measures and fire hazard risks for residents in fire hazard severity zones.

PS-5.6: Emergency Evacuation Routes and Access. Work with the Orange County Fire Authority and the Orange County Sherriff's Department to maintain, update, and regularly exercise emergency access, protocols, and evacuation routes to assess their effectiveness.

PS-5.9: Public Awareness. Prepare residents for emergency situations by making emergency strategies, including evacuation routes, publicly-known and easily accessible

PF-3.3: Water Pressure. Coordinate with local water districts and Orange County Fire Authority to encourage water pressures that remain high enough throughout all areas of the community to provided needed water capacity for fire protection.

PF-8.1: Police and Fire Department Facilities. Encourage the Orange County Fire Authority and the Orange County Sheriff's Department to maintain adequate staff and equipment to provide efficient, high quality, and responsive fire protection and emergency medical services to existing and future growth in Lake Forest.

PF-8.2: Emergency Response Times. Work cooperatively with the Orange County Fire Authority, Orange County Sheriff's Department, and providers of emergency medical services to ensure acceptable response times in accordance with provider standards.

PF-8.3: Department Consultation. Promote coordination between the City of Lake Forest and Police and Fire services during the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.

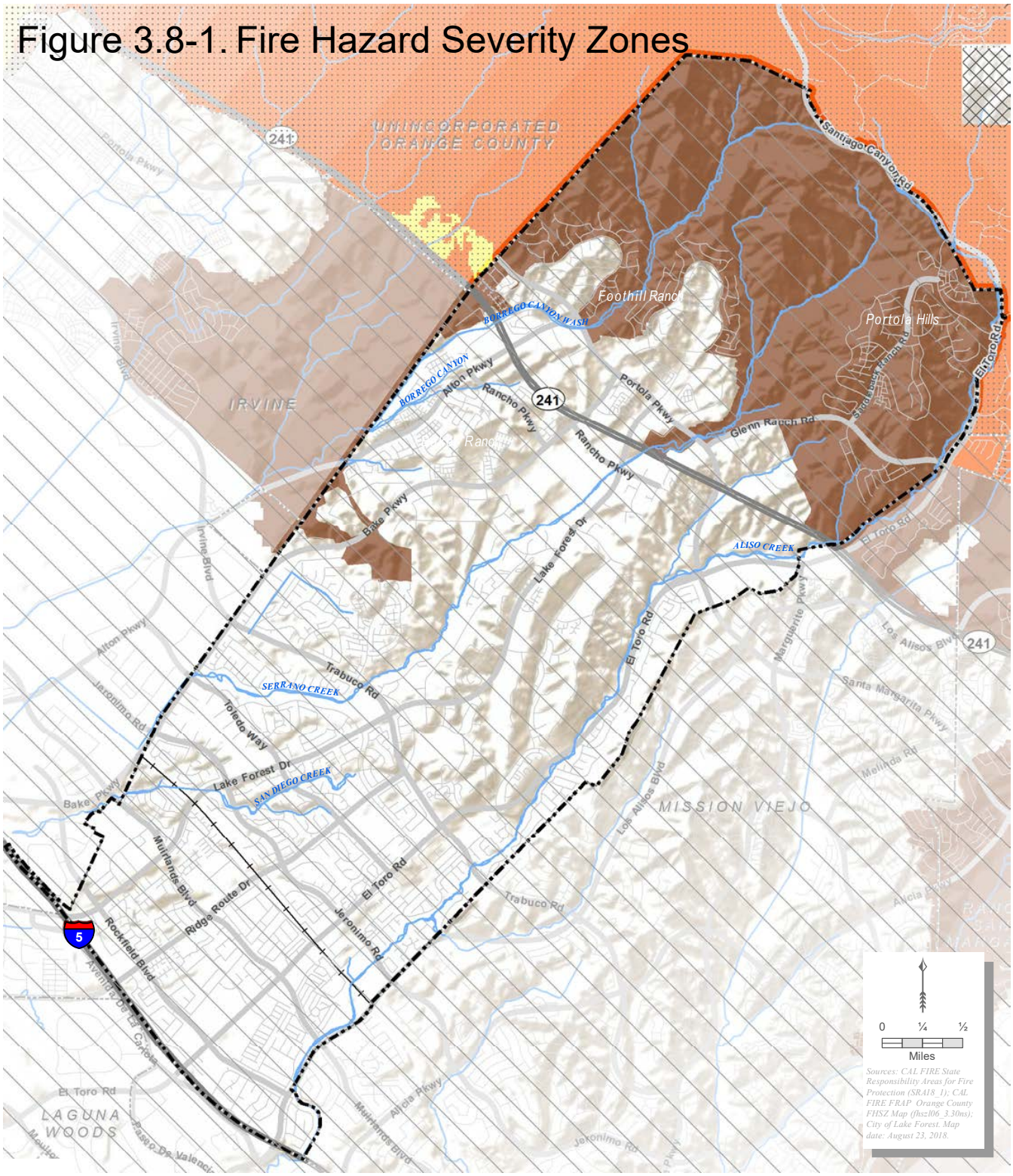
PF-8.5: Community Awareness. Support the Orange County Fire Authority and the Orange County Sheriff's Department in promoting community awareness regarding crime through public service organizations, and the establishment of citizen involved programs and patrols.

PF-8.7: Technology. Encourage and support efforts to improve police, fire, and emergency medical services through improved use of modern technology and industry best practices.

ACTION

PF-8a: The Orange County Fire Authority and City Engineer will review proposed development projects and street networks to evaluate the accessibility for fire engines and other emergency response functions.

Figure 3.8-1. Fire Hazard Severity Zones



Legend

City of Lake Forest

Responsibility Areas

- Federal
- Local
- State

Fire Hazard Severity Zones

In Local Responsibility Areas

- Very High

In State Responsibility Areas

- Moderate
- High
- Very High

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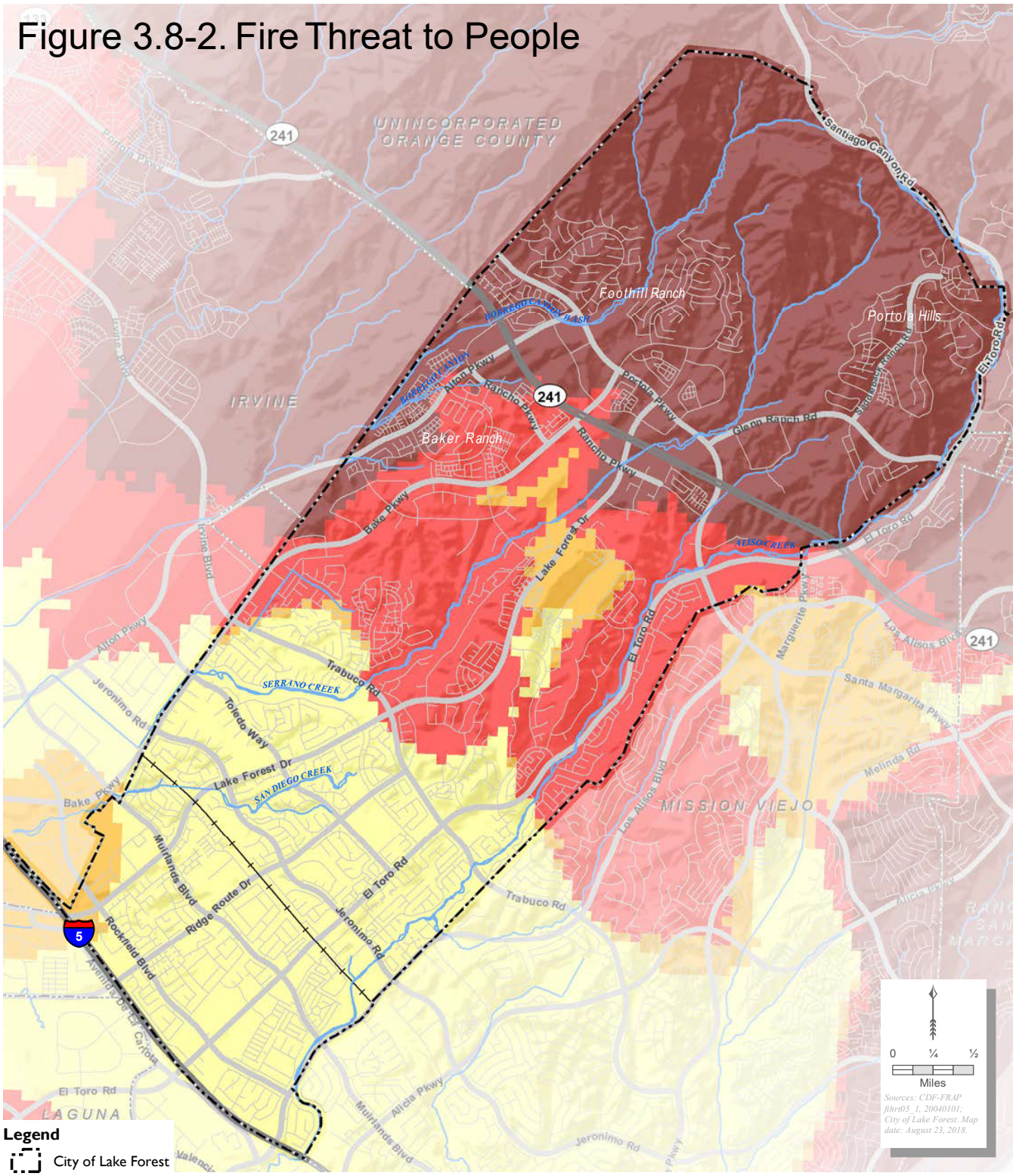
Figure 3.8-2. Fire Threat to People



Legend

City of Lake Forest

Fire Threat to People*

- Little or No Threat to People
- Moderate Threat to People
- High Threat to People
- Very High Threat to People
- Extreme Threat to People

** Fire Threat is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create 4 threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severiety for the higher threat classes.*

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This section provides a background discussion of the regional hydrology, flooding, water quality, water purveyors, and water sources in Lake Forest. This section is organized with an existing setting, regulatory setting, and impact analysis.

No comments were received during the NOP comment period regarding this environmental topic.

KEY TERMS

Groundwater: Water that is underground and below the water table, as opposed to surface water, which flows across the ground surface. Water beneath the earth's surface fills the spaces in soil, gravel, or rock formations. Pockets of groundwater are often called "aquifers" and are the source of drinking water for a large percentage of the population in the United States. Groundwater is often extracted using wells which pump the water out of the ground and up to the surface. Groundwater is naturally replenished by surface water from precipitation, streams, and rivers when this recharge reaches the water table.

Surface water: Water collected on the ground or from a stream, river, lake, wetland, or ocean. Surface water is naturally replenished through precipitation, but is naturally lost through evaporation and seepage into soil.

3.9.1 EXISTING SETTING

REGIONAL HYDROLOGY

The City of Lake Forest is surrounded by the City of Irvine to the west; Whiting Ranch Wilderness Park and an unincorporated area of Orange County to the north; the City of Mission Viejo to the east and south; and the Cities of Laguna Hills and Laguna Woods to the south.

The terrain in the City of Lake Forest ranges from the Saddleback Valley in the southern part of the City, to low hills in the north that lead up to the foothills of the Santa Ana Mountains further north of the City. Much of the City of Lake Forest has a gentle southwest slope, with elevations ranging from approximately 300 feet above mean sea level (amsl) at the southwestern corner of the City to approximately 1,500 feet amsl at the northern end of the City.

CLIMATE

Climate is Mediterranean, characterized by warm summers, cool winters, and highly seasonal rainfall; nearly all rain falls between late fall to early spring with nearly no precipitation during the summer months. Potential evapotranspiration exceeds precipitation and lower reaches of rivers are generally dry in the summer under natural conditions. Mean precipitation within the Proposed Project vicinity is approximately 15 inches per year with 87 percent occurring within November through March.

WATERSHEDS

A watershed is a region that is bound by a divide that drains to a common watercourse or body of water. Watersheds serve an important biological function, oftentimes supporting an abundance of aquatic and terrestrial wildlife including special status species and anadromous and native local fisheries. Watersheds provide conditions necessary for riparian habitat.

The State uses a hierarchical naming and numbering convention to define watershed areas for management purposes. This means that boundaries are defined according to size and topography, with multiple sub-watersheds within larger watersheds. Table 3.9-1 shows the primary watershed classification levels used by the State of California. The second column indicates the approximate size that a watershed area may be within a particular classification level, although variation in size is common.

TABLE 3.9-1: STATE OF CALIFORNIA WATERSHED HIERARCHY NAMING CONVENTION

WATERSHED LEVEL	*APPROXIMATE SQUARE MILES (ACRES)*	*DESCRIPTION*
Hydrologic Region (HR)	12,735 (8,150,000)	Defined by large-scale topographic and geologic considerations. The State of California is divided into ten HRs.
Hydrologic Unit (HU)	672 (430,000)	Defined by surface drainage; may include a major river watershed, groundwater basin, or closed drainage, among others.
Hydrologic Area (HA)	244 (156,000)	Major subdivisions of hydrologic units, such as by major tributaries, groundwater attributes, or stream components.
Hydrologic Sub-Area (HSA)	195 (125,000)	A major segment of an HA with significant geographical characteristics or hydrological homogeneity.

SOURCE: CALWATER, CALIFORNIA INTERAGENCY WATERSHED MAPPING COMMITTEE 2008

Hydrologic Region

The City of Lake Forest is located within the South Coast Hydrologic Region (HR), a large coastal watershed in southern California (DWR 2003: 148). The South Coast HR spans approximately 6.78 million acres and is bounded on the west by the Pacific Ocean, on the north by the Transverse Ranges, on the east by the Colorado River HR, and on the south by the international boundary with Mexico.

Hydrologic Unit

Within the South Coast HR, the City of Lake Forest is located within two hydrologic units (HU), the San Juan HU and Santa Ana River HU. The San Diego Regional Water Quality Control Board (SDRWQCB) governs basin planning and water quality within the San Juan HU and the Santa Ana Regional Water Quality Control Board (SARWQCB) governs basin planning and water quality within the Santa Ana River HU. Figure 3.9-1 shows Hydrologic Units within and surrounding the City.

Hydrologic Sub-Area

There are several hydrologic sub-areas within and throughout City of Lake Forest. Analysis of hydrologic sub-areas is appropriate for the review of individual projects, but is not appropriate for the watershed analysis of the City's General Plan. Figure 3.9-2 shows Hydrologic Areas within and surrounding the City.

CREEKS AND FLOOD CONTROL FACILITIES

The City of Lake Forest lies within the drainages of the Aliso Creek Watershed and the Newport Bay Watershed. Aliso Creek is a natural creek located along the west side of El Toro Road. The creek flows through open space and urban development and outlets at the ocean at Aliso Creek Beach. Aliso Creek's watershed encompasses 23,000 acres, and includes natural open space, rural and urban development, agriculture and ranching, regional parks and other recreational facilities. The Newport Bay Watershed covers 112.2 square miles in central Orange County. Its main tributary, San Diego Creek, drains into Upper Newport Bay. Small tributaries include Serrano Creek, Borrego Canyon Wash, Agua Chinon Wash, Bee Canyon Wash, Peters Canyon Wash, Sand Canyon Wash, Bonita Canyon Creek, and the Santa Ana Delhi Channel. Figure 3.9-2 (Hydrologic Areas) shows local waterways in relation to the City.

GROUNDWATER

The City of Lake Forest is underlain by the Orange County Groundwater Basin (OCWD 2015). The Orange County Groundwater Basin, as defined by DWR Bulletin 118 Basin 8-1, can be subdivided into subbasins and the coastal region can be distinguished by higher and lower elevation areas. The Main Basin is the largest sub-basin, where the majority of groundwater production occurs (note: the City of Lake Forest is located above the Main Basin).

The Orange County Groundwater Basin stores an estimated 66 million acre-feet of water, although only a fraction of this can be sustainably pumped without causing physical damage such as seawater intrusion or potential land subsidence. The basin underlies north and central Orange County beneath broad lowlands known as the Tustin and Downey plains. The basin covers an area of approximately 350 square miles, bordered by the Coyote Hills and Chino Hills to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean to the southwest. The basin boundary extends to the Orange County-Los Angeles County line to the northwest, where groundwater flow is unrestricted across the county line into the Central Basin of Los Angeles County.

The groundwater basin was formed in a synclinal, northwest-trending trough that deepens as it continues beyond the Orange-Los Angeles county line. The Newport-Inglewood fault zone, San Joaquin Hills, Coyote Hills, and Santa Ana Mountains form the uplifted margins of the syncline. The total thickness of sedimentary rocks in the basin surpasses 20,000 feet, of which only the upper 2,000 to 4,000 feet contain fresh water.

OCWD groundwater basin is subdivided into three major aquifer systems. The three aquifer systems, known as the Shallow, Principal, and Deep, are hydraulically connected, as groundwater

is able to flow between them via leakage through the intervening aquitards or discontinuities in the aquitards. The Shallow Aquifer system overlies the entire basin and includes the prolific Talbert Aquifer. It generally occurs from the surface to approximately 250 feet below ground surface. The majority of groundwater from the shallow aquifer is pumped by small water systems for industrial and agricultural use, although the cities of Garden Grove and Newport Beach, and the Yorba Linda Water District, operate wells that pump from the shallow aquifer for municipal use.

Over 90 percent of groundwater production occurs from wells that are screened within the Principal Aquifer system at depths between 200 and 1,300 feet. A minor amount of groundwater is pumped from the Deep Aquifer, which underlies the Principal Aquifer system and is up to 2,000 feet deep in the center of the basin. Hindering production from the Deep Aquifer system is the depth and the presence of amber colored groundwater in some areas.

FLOODPLAIN MAPPING

FEMA Flood Zones

FEMA mapping provides important guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The FEMA FIRM for the Planning Area is shown on Figure 3.9-3.

Areas that are subject to flooding are indicated by a series of alphabetical symbols, indicating anticipated exposure to flood events:

- **Zone A:** Subject to 100-year flooding with no base flood elevation determined. Identified as an area that has a one percent chance of being flooded in any given year.
- **Zone AE:** Subject to 100-year flooding with base flood elevations determined.
- **Zone AH:** Subject to 100-year flooding with flood depths between one and three feet being areas of ponding with base flood elevations determined.
- **500-year Flood Zone:** Subject to 500-year flooding. Identified as an area that has a 0.2 percent chance of being flooded in a given year.

As shown in Figure 3.9-3, only a small area within Lake Forest is located within a mapped portion of either the 100-year and 500- year FEMA flood zones. The areas documented to be subject to 100-year and 500-year flooding within Lake Forest are located along Aliso Creek, Serrano Creek, Borrego Canyon Wash, San Diego Creek, and the lakes. Risk of flooding along these areas is limited, since flooding within this location would be likely to only affect a small area outside of the normal creek bed. The largest area of Lake Forest within the 100-year and 500-year FEMA flood zones is along the Aliso Creek bed and bike trail near Heroes Park along the eastern edge of the City.

The City of Lake Forest is a participant in the National Flood Insurance Program (NFIP). Communities participating in the NFIP must adopt and enforce minimum floodplain management

standards, including identification of flood hazards and flooding risks. Participating in the NFIP allows communities to purchase lower-cost insurance protection against losses from flooding.

Dam Inundation

Earthquakes centered close to a dam are typically the most likely cause of dam failure. Dam Inundation maps have been required in California since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. Monitoring and mitigation of dam failure is constantly occurring at both the federal and state levels. There are no potential dam inundation areas in the City of Lake Forest. The closest threats of dam failure would be the El Toro Reservoir Dam and the Upper Oso Reservoir Dam in the City of Mission Viejo, but they pose no immediate threat to residents of Lake Forest.

WATER QUALITY

Surface water quality is affected by point source and non-point source pollutants. Point source pollutants are those emitted at a specific point, such as a pipe, while non-point source pollutants are typically generated by surface runoff from diffuse sources, such as streets, paved areas, and landscaped areas. Point source pollutants are controlled with pollutant discharge regulations or waste discharge requirements (WDRs). Non-point source pollutants are more difficult to monitor and control, although they are important contributors to surface water quality in urban areas.

Stormwater runoff pollutants vary based on land use, topography, the amount of impervious surface, and the amount and frequency of rainfall and irrigation practices. Runoff in developed areas typically contains oil, grease, and metals accumulated in streets, driveways, parking lots, and rooftops, as well as pesticides, herbicides, particulate matter, nutrients, animal waste, and other oxygen-demanding substances from landscaped areas. The highest pollutant concentrations usually occur at the beginning of the wet season during the “first flush.”

Water quality in the City is governed by the San Diego Regional Water Quality Control Board (SDRWQCB) and the Santa Ana Regional Water Quality Control Board (SARWQCB), which set water quality standards in their Water Quality Control Plan for the respective basins (Basin Plans). The Basin Plans identify beneficial uses for surface water and groundwater and establish water quality objectives to attain those beneficial uses.

The Clean Water Act (CWA) 303(d) list is a register of impaired and threatened waters which the CWA requires all states to submit for Environmental Protection Agency approval. The list identifies all waters where the required pollution control measures have so far been unsuccessful in reaching or maintaining the required water quality standards. Waters that are listed are known as “impaired.” CWA Section 303(d) lists four water bodies within the City of Lake Forest: Aliso Creek, Serrano Creek, Borrego Creek (from SR 241 to Irvine Boulevard), and San Diego Creek Reach 2. These are described in more detail as follows (with estimated Total Maximum Daily Load completion date in parenthesis):

Aliso Creek is listed as impaired from the following pollutants: benthic community effects (2025), indicator bacteria (2011), malathion (2029), nitrogen (2019), phosphorus (2019), selenium (2021), and toxicity (2019).

Serrano Creek is listed as impaired from the following pollutants: ammonia (2021), benthic community effects (2027), indicator bacteria (2021), and toxicity (2027).

Borrego Creek (from SR 241 to Irvine Boulevard) is listed as impaired from the following pollutants: ammonia (2021), and indicator bacteria (2021).

San Diego Creek Reach 2 is listed as impaired from the following pollutants: benthic community effects (2027), indicator bacteria (2021), nutrients (1999), and sedimentation/siltation (1999).

Storm water runoff may play a role in the water quality impairments described above. Runoff that occurs as overland flow across yards, driveways, and public streets is intercepted by the storm water drainage system and conveyed to local drainages before eventually being routed to the Pacific. This storm water can carry pollutants that can enter the local waterways and result in the types of water quality impairments described above. Common sources of storm water pollution in the City include litter, trash, pet waste, paint residue, organic material (yard waste), fertilizers, pesticides, sediments, construction debris, metals from automobile brake pad dust, air pollutants that settle on the ground or attach to rainwater, cooking grease, illegally dumped motor oil, and other harmful fluids.

3.9.2 REGULATORY SETTING

There are a number of regulatory agencies whose responsibility includes the oversight of the water resources of the state and nation including the Federal Emergency Management Agency, the US Environmental Protection Agency, the State Water Resources Board, and the Regional Water Quality Control Board. The following is an overview of the federal, state and local regulations that are applicable to the proposed project.

FEDERAL

Clean Water Act

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The CWA establishes the basic structure for regulating the discharges of pollutants into the waters of the United States and gives the US Environmental Protection Agency (EPA) the authority to implement pollution control programs. The statute's goal is to regulate all discharges into the nation's waters and to restore, maintain, and preserve the integrity of those waters. The CWA sets

water quality standards for all contaminants in surface waters and mandates permits for wastewater and stormwater discharges.

The CWA also requires states to establish site-specific water quality standards for navigable bodies of water and regulates other activities that affect water quality, such as dredging and the filling of wetlands. The following CWA sections assist in ensuring water quality for the water of the United States:

CWA Section 208 requires the use of best management practices (BMPs) to control the discharge of pollutants in stormwater during construction CWA Section 303(d) requires the creation of a list of impaired water bodies by states, territories, and authorized tribes; evaluation of lawful activities that may impact impaired water bodies, and preparation of plans to improve the quality of these water bodies. CWA Section 303(d) also establishes Total Maximum Daily Loads (TMDLs), which is the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards CWA Section 404 authorizes the US Army Corps of Engineers to require permits that will discharge dredge or fill materials into waters in the US, including wetlands.

In California, the EPA has designated the State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCBs) with the authority to identify beneficial uses and adopt applicable water quality objectives.

The SWRCB) is responsible for implementing the Clean Water Act and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits).

Federal Emergency Management Agency

FEMA operates the National Flood Insurance Program (NFIP). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the California Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

Flood Control Act

The Flood Control Act (1917) established survey and cost estimate requirements for flood hazards in the Sacramento Valley. All levees and structures constructed per the Act were to be maintained locally but controlled federally. All rights of way necessary for the construction of flood control infrastructure were to be provided to the Federal government at no cost.

Federal involvement in the construction of flood control infrastructure, primarily dams and levees, became more pronounced upon passage of the Flood Control Act of 1936.

Flood Disaster Protection Act (FDPA)

The FDPA of 1973 was a response to the shortcomings of the NFIP, which were experienced during the flood season of 1972. The FDPA prohibited Federal assistance, including acquisition, construction, and financial assistance, within delineated floodplains in non-participating NFIP communities. Furthermore, all Federal agencies and/or federally insured and federally regulated lenders must require flood insurance for all acquisitions or developments in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP.

Improvements, construction, and developments within SFHAs are generally subject to the following standards:

- All new construction and substantial improvements of residential buildings must have the lowest floor (including basement) elevated to or above the base flood elevation (BFE).
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE.
- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns.
- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

National Flood Insurance Program (NFIP)

Per the National Flood Insurance Act of 1968, the NFIP has three fundamental purposes: *Better indemnify individuals for flood losses through insurance; Reduce future flood damages through State and community floodplain management regulations; and Reduce Federal expenditures for disaster assistance and flood control.*

While the Act provided for subsidized flood insurance for existing structures, the provision of flood insurance by FEMA became contingent on the adoption of floodplain regulations at the local level.

National Pollutant Discharge Elimination System (NPDES)

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, oceans, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the Federal Clean Water Act, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.)

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the EPA Regional Administrator (EPA Region 9). The terms of these NPDES permits implement pertinent provisions of the Federal Clean Water Act and the Act's implementing regulations, including pre-treatment, sludge management, effluent

limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWA.

NPDES permitting authority is administered by the California State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCB). The Plan Area is in a watershed administered by the LARWQCB.

Individual projects in the City that disturb more than one acre would be required to obtain NPDES coverage under the California General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit). The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) describing Best Management Practices (BMP) the discharger would use to prevent and retain storm water runoff. The SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a waterbody listed on the 303(d) list for sediment.

Rivers and Harbors Appropriation Act of 1899

One of the country's first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

Water Pollution Control Act of 1972

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States

STATE

California Fish and Wildlife Code

The California Department of Fish and Wildlife (CDFW) protects streams, water bodies, and riparian corridors through the streambed alteration agreement process under Section 1600 to 1616 of the California Fish and Game Code. The California Fish and Game Code establishes that "an entity may not substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river stream, or lake" (Fish and Game Code Section 1602(a)) without notifying the CDFW, incorporating necessary mitigation and obtaining a streambed alteration agreement. The CDFWs jurisdiction extends to the top of banks and often includes the outer edge of riparian vegetation canopy cover.

California Code of Regulations

California Code of Regulations (CCR) Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the

Department of Health Services. The Consumer Confidence Report provides information regarding the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminants levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

California Government Code

Relevant sections of the California Government Code are identified below.

SECTION 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

SECTION 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

SECTION 8589.4

California Government Code §8589.4, commonly referred to as the Potential Flooding-Dam Inundation Act, requires owners of dams to prepare maps showing potential inundation areas in the event of dam failure. A dam failure inundation zone is different from a flood hazard zone under the National Flood Insurance Program (NFIP). NFIP flood zones are areas along streams or coasts where storm flooding is possible from a "100-year flood." In contrast, a dam failure inundation zone is the area downstream from a dam that could be flooded in the event of dam failure due to an earthquake or other catastrophe. Dam failure inundation maps are reviewed and approved by the California Office of Emergency Services (OES). Sellers of real estate within inundation zones are required to disclose this information to prospective buyers.

California Department of Health Services

The Department of Health Services, Division of Drinking Water and Environmental Management, oversees the Drinking Water Program. The Drinking Water Program regulates public water systems and certifies drinking water treatment and distribution operators. It provides support for small water systems and for improving their technical, managerial, and financial capacity. It provides subsidized funding for water system improvements under the State Revolving Fund ("SRF") and Proposition 50 programs. The Drinking Water Program also oversees water recycling projects, permits water treatment devices, supports and promotes water system security, and oversees the Drinking Water Treatment and Research Fund for MTBE and other oxygenates.

Consumer Confidence Report Requirements

California Code of Regulations (CCR) Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the Department of Health Services. The Consumer Confidence Report provides information regarding

the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminant levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

California Water Code

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the Regional Water Quality Control Boards (RWQCBs) power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

Senate Bill (SB) 610 and Assembly Bill (AB) 901

The State Legislature passed SB 610 and AB 901 in 2001. Both measures modified the Urban Water Management Planning Act.

SB 610 requires additional information in an urban water management plan if groundwater is identified as a source of water available to an urban water supplier. It also requires that the plan include a description of all water supply projects and programs that may be undertaken to meet total projected water use. SB 610 requires a city or county that determines a project is subject to CEQA to identify any public water system that may supply water to the project and to request identified public water systems to prepare a specified water supply assessment. The assessment must include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and water received in prior years pursuant to these entitlements, rights, and contracts.

AB 901 requires an urban water management plan to include information, to the extent practicable, relating to the quality of existing sources of water available to an urban water supplier over given time periods. AB 901 also requires information on the manner in which water quality affects water management strategies and supply reliability. The bill requires a plan to describe plans to supplement a water source that may not be available at a consistent level of use, to the extent practicable. Additional findings and declarations relating to water quality are required.

Senate Bill 221

SB 221 adds Government Code Section 66455.3, requiring that the local water agency be sent a copy of any proposed residential subdivision of more than 500 dwelling units within five days of the subdivision application being accepted as complete for processing by the city or county. It also adds Government Code Section 66473.7, establishing detailed requirements for establishing whether a "sufficient water supply" exists to support any proposed residential subdivisions of more than 500 dwellings, including any such subdivision involving a development agreement. When approving a qualifying subdivision tentative map, the city or county must include a condition requiring availability of a sufficient water supply. The applicable public water system must provide proof of availability. If there is no public water system, the city or county must undertake the analysis described in Government Code Section 66473.7. The analysis must include consideration of effects on other users of water and groundwater.

State Updated Model Landscape Ordinance

Under Assembly Bill (AB) 1881, the updated Model Landscape Ordinance requires cities and counties to adopt landscape water conservation ordinances by January 31, 2010 or to adopt a different ordinance that is at least as effective in conserving water as the updated Model Ordinance (MO). Chapter 9.146 of the Lake Forest Municipal Code (Water Efficient Landscape Regulations) includes landscaping water use standards.

Water Quality Control Basin Plan

A Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. The Basin Plan is a resource for the Regional Board and others who use water and/or discharge wastewater in the region that the Basin Plan is designed to cover. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues. The City of Lake Forest is split between two regions – the Santa Ana River Basin and the San Diego River Basin, approximately delineated by El Toro Road.

Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin

The Santa Ana Region (Region 8) includes the upper and lower Santa Ana River watersheds, the San Jacinto River watershed, and several other small drainage areas. The Santa Ana Region covers parts of southwestern San Bernardino County, western Riverside County, and northwestern Orange County. The northwestern portion of the City of Lake Forest, approximately north of El Toro Road, is located within this region.

Water Quality Control Plan (Basin Plan) for the San Diego Basin

The San Diego Region (Region 9) occurs within the Peninsula Range Physiographic Province of California. One of the most prominent physical features in the region is the northwest-trending Peninsula Range which includes from the north to south, the Santa Ana, Agua Tibia, Palomar, Volcan, Cuyamaca and Laguna Mountains. The southeastern portions of the City fall under the requirements of the San Diego Regional Water Quality Control Board. The San Diego Region is

divided into a coastal plain area, a central mountain-valley area, and an eastern mountain valley area. The southern portion of the City of Lake Forest is located within this region.

State Water Resources Control Board (State Water Board) Storm Water Strategy

The Storm Water Strategy is founded on the results of the Storm Water Strategic Initiative, which served to direct the State Water Board's role in storm water resources management and evolve the Storm Water Program by a) developing guiding principles to serve as the foundation of the storm water program, b) identifying issues that support or inhibit the program from aligning with the guiding principles, and c) proposing and prioritizing projects that the Water Boards could implement to address those issues.

The State Water Board staff created a strategy-based document called the Strategy to Optimize Management of Storm Water (STORMS). STORMS includes a program vision, missions, goals, objectives, projects, timelines, and consideration of the most effective integration of project outcomes into the Water Board's Storm Water Program.

LOCAL

Orange County Water District Groundwater Management Plan 2015 Update

The Orange County Water District's (OCWD) first Groundwater Management Plan was published in 1989; the Groundwater Management Plan 2015 Update is the fifth update. In 2014, the California Sustainable Groundwater Management Act was passed. The new law provided authority for agencies to develop and implement Groundwater Sustainability Plans or alternative plans that demonstrate the basin has operated within its sustainable yield over a period of at least 10 years. This plan was developed to help the OCWD manage the Orange County Groundwater Basin.

South Orange County (San Juan Hydrologic Unit) Water Quality Improvement Plan

The South County Water Quality Improvement Plan for the San Juan Hydrologic Unit was developed through a regulatory partnership comprising the cities of Aliso Viejo, Dana Point, Laguna Beach, Laguna Hills, Laguna Niguel, Laguna Woods, Lake Forest, Mission Viejo, Rancho Santa Margarita, San Clemente, San Juan Capistrano, the County of Orange and the Orange County Flood Control District, who operate an interconnected stormwater sewer system (MS4) which discharges stormwater and urban runoff. The partnership developed the Plan to address the adverse impacts to surface waters, often collectively referred to as "urban stream syndrome" that can arise from the imprint of urbanization on the landscape.

Orange County Drainage Area Management Plan

The specific water pollutant control elements of the Orange County Stormwater Program are documented in the 2003 Drainage Area Management Plan (DAMP) which is the County's primary policy, planning and implementation document for municipal NPDES Stormwater Permit

compliance. The DAMP was prepared and is periodically updated using a consensus building process involving public and private sector input and public review through the California Environmental Quality Act (CEQA) process.

The DAMP is the principal guidance and compliance document for the county-wide implementation of the stormwater program and provides a foundation for the Orange County Stormwater Permittees to implement model programs designed to prevent pollutants from entering receiving waters to the maximum extent practicable. Review the Orange County DAMP.

City of Lake Forest Local Implementation Plan

The City Local Implementation Plan (LIP) is the principal guidance and compliance document specific to the City of Lake Forest's jurisdiction. The LIP provides description and detail of the City's water quality program implementation activities. The LIP is designed to work in conjunction with the Orange County DAMP.

Orange County Stormwater Resource Plan

The Orange County Stormwater Resource Plan (OC SWRP) was prepared by Orange County per the requirements of SB 985. SB 985 requires the preparation of a Storm Water Resource Plan as an eligibility requirement for an entity to receive grant funding from a voter-approved bond initiative for a storm water and/or urban runoff project. Four primary significant planning efforts referenced throughout this OC SWRP are used for functional equivalency to meet the SWRP guidelines. These include (1) the 2013/2014 Reports of Waste Discharge (ROWDs), (2) Integrated Regional Watershed Management Plans for North, Central and South Orange County, (3) Watershed Infiltration and Hydromodification Management Plan (WIHMP) mapping tools, and (4) the South Orange County Water Quality Improvement Plan (WQIP).

Municipal NPDES Permit Waste Discharge Requirements

On May 19, 2009, the Santa Ana Regional Water Quality Control Board adopted Order No. R8-2009-0030, NPDES No. CAS618030. On December 16, 2009, the San Diego Regional Water Quality Control Board adopted Order No. R9-200-0002, NPDES No. CAS018740. These Municipal NPDES Permits require the permittees to continue to implement stormwater quality management programs and develop additional programs in order to control pollutants in stormwater discharges.

The City of Lake Forest is split by the jurisdictional boundaries of two California Regional Water Quality Control Boards. The northwestern portions of the City fall under the requirements of the Santa Ana Regional Water Quality Control Board, and the southeastern portions of the City fall under the requirements of the San Diego Regional Water Quality Control Board. The jurisdictional boundaries are defined by the geographic division of watersheds; however, the boundary line can roughly be delineated by El Toro Road.

City of Lake Forest Regional Water Management Plan (IRWMP)

Within Orange County, water resource management has been structured into three primary Watershed Management Areas (WMA):

- North Orange County WMA;
- Central Orange County WMA;
- South Orange County WMA.

The 11 watersheds in Orange County were grouped by similar characteristics into these three WMAs. The City of Lake Forest is an active participating member of the Central and South Orange County WMAs.

At its essence, the Watershed Management Area is a collaborative framework for municipalities and special purpose agencies to work collaboratively and find synergies across water resource disciplines. Its purpose is to bring together a wide variety of water resource managers in order to achieve more comprehensive and cost-effective solutions to Orange County's water resources needs. Member agencies voluntarily enter into a cooperative agreement that forms the WMA.

Governance includes a policy committee of elected officials, the Executive Committee, to oversee each Watershed Management Area. Senior staff from each member organization form a Management Committee to develop a joint work plan and oversee its implementation. Regular stakeholder forums are held to involve the public and share information across organizations within each Watershed Management Area.

These WMA groups and respective committees meet together on a regular basis to collaborate on water resource issues, including water supply, surface water quality, flood management, wastewater, and natural resource protection. Integrated Regional Water Management Plans (IRWMPs) have been completed for each WMA. Goals and solutions specific to each Watershed Management Area are formulated through consensus with participating stakeholders. Likewise, a custom slate of projects and programs is developed to address the water resource needs of each WMA. The Central and South Orange County WMAs have existing cooperative agreements in place.

City of Lake Forest Municipal Code

The City of Lake Forest is required to implement procedures with respect to the entry of non-storm water discharges into its municipal storm water system. The City of Lake Forest regulates storm water discharge in accordance with the NPDES permit through Chapter 15.14 of the Lake Forest Municipal Code, Stormwater Quality Management. Additionally, Chapter 8.30 provides erosion control and protection measures. Chapter 8.70 includes standards for flood damage prevention and floodplain management.

3.9.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with hydrology and water quality if it will:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - Result in substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
    - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
    - Impede or redirect flood flows.
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation.

IMPACTS AND MITIGATION

Impact 3.9-1: General Plan implementation could violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality or obstruct implementation of a water quality control plan (Less than Significant)

CONSTRUCTION-RELATED WATER QUALITY IMPACTS

Grading, excavation, removal of vegetation cover, and loading activities associated with future construction activities could temporarily increase runoff, erosion, and sedimentation. Construction activities also could result in soil compaction and wind erosion impacts that could adversely affect soils and reduce the revegetation potential at construction sites and staging areas.

As required by the Clean Water Act, each subsequent development project or improvement project will require an approved Storm Water Pollution Prevention Plan (SWPPP) that includes best management practices for grading and preservation of topsoil. A SWPPP is not required if the project will disturb less than one acre. SWPPPs are designed to control storm water quality

degradation to the extent practicable using best management practices during and after construction.

Future development project applicants must submit the SWPPP with a Notice of Intent to the RWQCB to obtain a General Permit. The RWQCB is an agency responsible for reviewing the SWPPP with the Notice of Intent, prior to issuance of a General Permit for the discharge of storm water during construction activities. The RWQCB accepts General Permit applications (with the SWPPP and Notice of Intent) after specific projects have been approved by the lead agency. The lead agency for each specific project that is larger than one acre is required to obtain a General Permit for discharge of storm water during construction activities prior to commencing construction (per the Clean Water Act).

The General Plan sets policies and actions for build-out of the City, but it does not envision or authorize any specific development project. Because of this, the site-specific details of potential future development projects are currently unknown and analysis of potential impacts of such projects is not feasible and would be speculative. However, each future project must include detailed project specific drainage plans that control storm water runoff and erosion, both during and after construction. The Regional Water Quality Control Board will require a project specific Storm Water Pollution Prevention Plan (SWPPP) to be prepared for each future project that disturbs an area one acre or larger. The SWPPPs will include project specific best management measures that are designed to control drainage and erosion.

NEW DEVELOPMENT-RELATED WATER QUALITY IMPACTS

New development and infrastructure improvements projects under the proposed General Plan could introduce constituents into the storm water system that are typically associated with urban runoff. These constituents include sediments, petroleum hydrocarbons, pesticides, fertilizers, and heavy metals such as lead, zinc, and copper. These pollutants tend to build up during the dry months of the year. Precipitation during the early portion of the wet season (generally from November to April) washes away most of these pollutants, resulting in high pollutant concentrations in the initial wet weather runoff. This initial runoff is referred to as the “first flush” of storm events. Subsequent periods of rain would result in less concentrated pollutant levels in the runoff.

The majority of development allowed under the General Plan would be within areas currently developed with urban uses (as described in the Land Use and Design Element and associated General Plan Existing Conditions Report), and the amount and type of runoff generated by various future development and infrastructure projects would be similar to existing conditions. However, new development and infrastructure projects have the potential to result in increases in the amount of impervious surfaces throughout Lake Forest. Future increases in impervious surfaces would result in increased urban runoff, pollutants, and first flush roadway contaminants, as well as an increase in nutrients and other chemicals from landscaped areas. These constituents could result in water quality impacts to onsite and offsite drainage flows to area waterways.

Waters that are listed under Section 303(d) of the CWA are known as "impaired." CWA Section 303(d) lists four water bodies within the City of Lake Forest: Aliso Creek, Serrano Creek, Borrego Creek (from SR 241 to Irvine Boulevard), and San Diego Creek Reach 2. The total maximum daily load (TMDL) is a tool that establishes the allowable loadings or other quantifiable parameters for a waterbody and thereby the basis for the States to establish water quality-based controls. The purpose of TMDLs is to ensure that beneficial uses are restored and that water quality objectives are achieved. These are described in more detail as follows (with estimated Total Maximum Daily Load completion date in parenthesis):

Aliso Creek is listed as impaired from the following pollutants: benthic community effects (2025), indicator bacteria (2011), malathion (2029), nitrogen (2019), phosphorus (2019), selenium (2021), and toxicity (2019).

Serrano Creek is listed as impaired from the following pollutants: ammonia (2021), benthic community effects (2027), indicator bacteria (2021), and toxicity (2027).

Borrego Creek (from SR 241 to Irvine Boulevard) is listed as impaired from the following pollutants: ammonia (2021), and indicator bacteria (2021).

San Diego Creek Reach 2 is listed as impaired from the following pollutants: benthic community effects (2027), indicator bacteria (2021), nutrients (1999), and sedimentation/siltation (1999).

Storm water runoff may play a role in the water quality impairments described above. Runoff that occurs as overland flow across yards, driveways, and public streets is intercepted by the storm water drainage system and conveyed to local drainages before eventually being routed to the Pacific. This storm water can carry pollutants that can enter the local waterways and result in the types of water quality impairments described above. Common sources of storm water pollution in the City include litter, trash, pet waste, paint residue, organic material (yard waste), fertilizers, pesticides, sediments, construction debris, metals from automobile brake pad dust, air pollutants that settle on the ground or attach to rainwater, cooking grease, illegally dumped motor oil, and other harmful fluids.

Due to future development and infrastructure projects, the overall volume of runoff in Lake Forest could be increased compared to existing conditions. If the City's drainage system is not adequately designed, General Plan buildout could result in localized higher peak flow rates. Localized increases in flow would be significant if increases exceeded system capacity or contributed to bank erosion. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below, as well as the City's adopted Municipal Code requirements.

The General Plan sets policies and actions for build-out of the City, but it does not envision or authorize any specific development project. Because of this, the site-specific details of potential future development projects are currently unknown and analysis of potential impacts of such projects is not feasible and would be speculative. However, each future development and infrastructure project is required to prepare a detailed project specific drainage plan, Water Quality Management Plan, and a Storm Water Pollution Prevention Plan (SWPPP) that will control

storm water runoff and erosion, both during and after construction. If the project involves the discharge into surface waters the project proponent will need to acquire a Dewatering permit, NPDES permit, and Waste Discharge permit from the RWQCB and comply with all storm water sewer system (MS4) requirements.

As described above, under the Regulatory Setting, the City is required to implement a range of measures and procedures when reviewing new development and infrastructure projects.

Drainage Area Management Program. The Drainage Area Management Plan (DAMP) was created by the County of Orange, the OCFCD, and incorporated cities (permittees), and includes specific water pollutant requirements of the North Orange County Stormwater Program. The DAMP is the principal guidance and compliance document for the county-wide implementation of the Stormwater Program. It is the foundation for the permittees to implement model programs designed to prevent pollutants from entering receiving waters to the maximum extent practicable. Section 7 of the DAMP discusses issues relating to new developments and significant redevelopments.

Local Implementation Plan. The City Local Implementation Plan (LIP) is the principal guidance and compliance document specific to the City's jurisdiction for compliance with the requirements of the North Orange County MS4 Permit. The LIP provides the description and details of the City's water quality program implementation activities. The LIP is designed to work in conjunction with the Orange County DAMP. It should be noted that the Lake Forest LIP takes precedence over DAMP requirements.

Chapter 8.30 of the City's Municipal Code regulates grading and excavation activities.

- Section 8.30.150 specifies that grading activities be undertaken in compliance with NPDES and City requirements. Each grading project shall implement BMPs to ensure that discharges of pollutants are effectively prohibited and will not cause or contribute to an exceedance of water quality standards. Section 8.30.150 also specifies that, prior to the issuance by the City of a grading permit, the Department of Public Works and/or Development Services Department shall review the project plans.

- Section 8.30.152 specifies that projects with a grading permit shall submit an erosion control plan to the Director of the City of Lake Forest Public Works Department, or designee, for approval by September 15th of each year.

- Section 8.30.154 specifies required maintenance of erosion control and sediment control BMPs after rainstorms for projects with a grading permit.

Chapter 15.14 of the City's Municipal Code regulates stormwater quality and prohibits discharges of pollutants into surface waters unless the discharge is authorized by an NPDES permit.

- Section 15.14.040 requires that all new development and redevelopment projects comply with the requirements of the North Orange County MS4 Permit. Section 15.14.040

specifies that, prior to the issuance of a grading permit or building permit, the Department of Public Works and/or Development Services Department shall review the project plans.

- Section 15.14.050 requires preparation of an erosion and sediment control plan as a condition of approval for issuance of a construction or grading permit. Section 15.14.050 also requires implementation of construction BMPs to ensure that the discharge of pollutants from the site will be effectively prohibited and will not cause or contribute to an exceedance of water quality standards. Section 15.14.050 specifies that construction and grading activities be undertaken in compliance with NPDES and City requirements.
- Section 15.14.060 requires implementation of operational BMPs on all sites that have the potential to discharge a pollutant to the City's MS4.

Compliance with existing City and County construction and stormwater management codes and the DAMP, as outlined above, would reduce these potential impacts related to stormwater quality.

In addition, prior to the issuance of grading permits, each site developed under the proposed General Plan would be required to submit a site-specific drainage study and SWPPP to the City for approval.

While the primary regulatory mechanisms for ensuring that future development and infrastructure projects do not result in adverse water quality impacts are contained in the Lake Forest Municipal Code, the DAMP, and the LIP, the City of Lake Forest has developed the General Plan to include additional policies and actions that, when implemented, will further reduce water pollution from construction, new development, and new infrastructure projects, and protect and enhance natural storm drainage and water quality features. The policies and actions identified below include numerous requirements that would reduce the potential for General Plan implementation to result in increased water quality impacts. Actions by the City during the development review process require the review of development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased beyond pre-development levels during rain and flood events. In addition, compliance with the Clean Water Act and regulations enforced by the Regional Water Quality Control Board would ensure that construction-related impacts to water quality are minimized and future projects comply with all applicable laws and regulations.

The City manages local storm drain facilities and the Orange County Flood Control District (OCFCD) is responsible for regional flood control planning within the County. Provision of stormwater detention facilities as needed would reduce runoff rates and peak flows. The implementation of the General Plan policies and actions listed below include policies aimed to enhance stormwater quality and infiltration as well as actions to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure off-site runoff is not increased beyond pre-development levels. Existing regulatory requirements that manage water quality include requirements to obtain approval from the RWQCB for NPDES permits, other discharge permits, WQMPs, SWPPPs, and to implement Best Management Practices. These regulatory requirements are intended to ensure that water quality does not

degrade to levels that would violate water quality standards. Through implementation of the General Plan policies and actions listed below, implementation of the Lake Forest Municipal Code requirements identified above, compliance with mandatory Federal and State regulations, and compliance with the existing regulations for the San Diego Creek and Aliso Creek Watersheds would ensure that impacts to drainage patterns and water quality would be mitigated to a **less than significant level**.

GENERAL PLAN POLICIES AND ACTION THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PF-4.1: Statewide Requirements. Encourage water district compliance with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of sanitary sewer collection systems.

PF-4.2: Sewer Deposit Best Practices. Encourage wastewater service providers to identify and implement best practices and feasible technologies for wastewater collection and treatment, including those that reduce the amount of wastewater requiring treatment, prevent contamination, maintain the highest possible energy efficiency, and reduce costs and greenhouse gas (GHG) emissions.

PF-4.3: Reduced System Demand. Reduce wastewater system demand by encouraging water-conserving designs and equipment, encouraging water-conserving devices, and designing wastewater systems to minimize inflow and infiltration.

PF-4.4: Recycled Water. Work with water districts and end users to increase and maximize the use of recycled water for existing and future needs as new technology, funding, and infrastructure is available.

PF-4.5: Service Levels. Coordinate with water districts on proposed land use changes so that they can plan for adequate delivery of services to future development in Lake Forest.

PF-4.6: Public Education. Collaborate with water districts in developing a public education program that teaches residents and businesses how to help maintain a safe and clean wastewater system, such as by limiting the amount of oils, pesticides, and toxic chemicals entering the sewer system.

PF-5.1: Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.

PF-5.2: Data Collection. Encourage the Orange County Flood Control District to map, track, and analyze data on all current storm drain facilities in order to provide clear and accurate forecasts for future demand.

PF-5.3: Stormwater Runoff. Encourage that stormwater be directed towards permeable surfaces to allow for more percolation of stormwater into the ground.

PF-5.4: Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rain water for non-potable uses in compliance with applicable State regulations.

PF-5.5: Recycled Water. Explore the expansion of infrastructure for recycled stormwater for irrigation and other non-potable uses when safe, financially feasible, and available.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.

PF-5.8: County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

ACTION

PF-5a: Continue to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased beyond pre-development levels during rain and flood events.

Impact 3.9-2: General Plan implementation could result in the depletion of groundwater supplies or interfere substantially with groundwater recharge or conflict with a groundwater management plan. (Less than Significant)

The City of Lake Forest is underlain by the Orange County Groundwater Basin (OCWD 2015). The Orange County Groundwater Basin, as defined by DWR Bulletin 118 Basin 8-1, can be subdivided into subbasins and the coastal region can be distinguished by higher and lower elevation areas. The Main Basin is the largest sub-basin, where the majority of groundwater production occurs (note: the City of Lake Forest is located above the Main Basin).

The Orange County Groundwater Basin stores an estimated 66 million acre-feet of water, although only a fraction of this can be sustainably pumped without causing physical damage such as seawater intrusion or potential land subsidence. The basin underlies north and central Orange County beneath broad lowland known as the Tustin and Downey plains. The basin covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean to the southwest. The basin boundary extends to the Orange County-Los Angeles line to the northwest, where groundwater flow is unrestricted across the county line into the Central Basin of Los Angeles County.

The groundwater basin was formed in a synclinal, northwest-trending trough that deepens as it continues beyond the Orange-Los Angeles county line. The Newport-Inglewood fault zone, San Joaquin Hills, Coyote Hills, and Santa Ana Mountains form the uplifted margins of the syncline. The total thickness of sedimentary rocks in the basin surpasses 20,000 feet, of which only the upper 2,000 to 4,000 feet contain fresh water.

OCWD subdivided the groundwater basin into three major aquifer systems. The three aquifer systems, known as the Shallow, Principal, and Deep, are hydraulically connected, as groundwater is able to flow between them via leakage through the intervening aquitards or discontinuities in the aquitards. The Shallow Aquifer system overlies the entire basin and includes the prolific Talbert Aquifer. It generally occurs from the surface to approximately 250 feet below ground surface. The majority of groundwater from the shallow aquifer is pumped by small water systems for industrial and agricultural use, although the cities of Garden Grove and Newport Beach, and the Yorba Linda Water District, operate wells that pump from the shallow aquifer for municipal use.

Over 90 percent of groundwater production occurs from wells that are screened within the Principal Aquifer system at depths between 200 and 1,300 feet. A minor amount of groundwater is pumped from the Deep Aquifer, which underlies the Principal Aquifer system and is up to 2,000 feet deep in the center of the basin. Hindering production from the Deep Aquifer system is the depth and the presence of amber colored groundwater in some areas.

The City of Lake Forest does not directly provide water service to its residents. Rather, three separate, independent utility districts provide this service to residents within the City.

The majority of the City of Lake Forest's residents are provided water, wastewater collection, and wastewater treatment services by the Irvine Ranch Water District (IRWD), whose boundaries cover 8,300 acres in the City, or approximately 83 percent of the total area of the City. Residents located along the southwest edge of the City are provided these utility services by El Toro Water District (ETWD). ETWD serves approximately 1,421 acres or 13 percent of the total area of the City. Finally, a small portion of residents in the northeastern section of the City are serviced by Trabuco Canyon Water District (TCWD).

IRWD is one of the largest water districts in Orange County, serving the entire City of Irvine and portions of Tustin, Santa Ana, Costa Mesa, Newport Beach, and Lake Forest; an area of approximately 132 square miles. IRWD is a member agency of the Municipal Water District of Orange County (MWDOC), which is a wholesale importer and member agency of the Metropolitan Water District (MWD). As such, MWDOC is entitled to receive water from the available sources of MWD. IRWD receives its imported water supplies through MWDOC.

According to the most recent IRWD Water Master Plan update, groundwater makes up about 53 percent of the total water supply, recycled water makes up 24 percent, imported (treated and untreated) makes up 20 percent, and native surface water makes up around 3 percent.

Water is pumped from the Orange County Groundwater Basin through seven potable production wells. The Orange County Groundwater Basin is managed by Orange County Water District (OCWD) which has the authority to impose replenishment assessments and basin equity

assessments on production. The primary mechanism used by OCWD to manage pumping from the basin is the Basin Production Percentage (BPP). The BPP is the percentage of each producer's water supply that is allowed from groundwater pumped from the basin without incurring a financial penalty. The BPP is set on an annual basis and is uniform for all producers within the groundwater basin's watershed. Groundwater pumping above the BPP is assessed an additional charge that creates a disincentive for over-producing. Currently, and for the foreseeable future, the BPP will be limited to 75 percent. The 2014 IRWD Water Resources Master Plan Update states IRWD is looking to expand groundwater production in the future to max out their groundwater production to the max BPP of 75 percent.

The 2015 IRWD UWMP developed future water demand projections and future water supply projections for the entire utility district. These projections were used to analyze if IRWD had enough supply to meet the projected water demand. The projections show IRWD is projected to have significantly more supply than demand in 2035 (the furthest projected year).

ETWD is mostly built out, so increases in future water demand would most likely result from redevelopment of existing land uses. The 2004 ETWD Master Plan identifies a range of potential development scenarios that may create new water demands. But because that plan is from 2004, the scenarios will be reassessed and updated if and when the General Plan is adopted. For reference, the 2004 ETWD Master Plan estimates that the development scenarios would increase the average day domestic water demand by 239 gpm, or 0.344 mgd, or 0.532 cfs.

The 2004 ETWD Master Plan states that the District's capacity in the Allen-McColloch Pipeline (AMP) is equivalent to the maximum day demand, therefore the current supply is deemed adequate. Estimated future demands increase only slightly, therefore additional turnout capacity is not anticipated. Projected potable water demand and supply values from the 2015 ETWD UMWP are presented in Table 3.9-2. Since ETWD relies completely on imported water from MWDOC, the available supply presented is equal to the demand.

Customers within the Portola Hills community are served potable water by IRWD but are billed through the Trabuco Canyon Water District (TCWD), therefore supply and demand are calculated utilizing Irvine Ranch Water District (IRWD) data. The community of Portola Hills (billed through TCWD) has an average day demand of 0.24 mgd and a maximum day demand of 0.48 mgd. The community is already built out and no redevelopment has been planned. Therefore, future demand are expected to remain the same. These Portola Hills TCWD demand values are included in the projected demand for IRWD in Table 3.9-2.

TABLE 3.9-2: PROJECTED POTABLE WATER DEMAND VS. SUPPLY (ACRE-FEET)

UTILITY DISTRICT	*PROJECTED 2035 DEMAND*	*PROJECTED 2035 SUPPLY*
IRWD	81,996	111,277
ETWD	7,315	7,315

NOTE: WATER DEMANDS GENERATED BY THE PORTOLA HILLS COMMUNITY ARE INCLUDED IN THE IRWD DEMANDS. IRWD DEMANDS AND SUPPLY BASED ON 2015 IRWD UMWP. ETWD DEMANDS AND SUPPLY BASED ON 2015 ETWD UMWP.
SOURCE: WEST YOST ASSOCIATES, 2018.

The Orange County Water District's (OCWD) first Groundwater Management Plan was published in 1989; the Groundwater Management Plan 2015 Update is the fifth update. In 2014, the California Sustainable Groundwater Management Act was passed. The new law provided authority for agencies to develop and implement Groundwater Sustainability Plans or alternative plans that demonstrate the basin has operated within its sustainable yield over a period of at least 10 years.

Subsequent development projects under the General Plan, such as residential, commercial, industrial, and roadway projects would result in new impervious surfaces and could reduce rainwater infiltration and groundwater recharge. However, the majority of the developable areas within the city are currently developed with urban uses. The majority of open undeveloped lands within the city are designated for parks and open space uses. The proposed General Plan Land Use Map does not re-designate any areas currently designated for open spaces uses to urban uses. The amount of new pavement and impervious surfaces, and the extent to which they affect infiltration, depends on the site-specific features and soil types of a given project site. Projects located in urban areas would have less of an impact than projects converting open lands and spaces.

Given that implementation and future buildout of the proposed General Plan would not appreciably add to the volume of imperious surfaces in Lake Forest, when compared to the overall size of the regional groundwater basin recharge area, and that there are adequate water supplies (including groundwater) to serve the projected buildout demand of the General Plan, this potential impact would be **less than significant**, and no additional mitigation is required.

While mitigation is not required for this less than significant impact, the General Plan includes policies that support water conservation, the use of permeable surfaces and the use of recycled water for non-potable uses and coordination with local water districts when planning for adequate capacity to accommodate future growth. The General Plan and development codes are consistent with the Groundwater Management Plan. Implementation of the following General Plan policies, combined with allocation standard for water producers set by the OCWD Groundwater Management Plan Basin Production Percentage (BPP), would further ensure that the General Plan would have a **less than significant** impact relative to this topic.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

PF-3.1: Coordination with Water Districts. Coordinate with local water districts when considering land use changes in order to assist the districts in planning for adequate capacity to accommodate future growth.

PF-3.2: Use of Recycled Water. Work collaboratively with local water districts to encourage the use of recycled water for irrigation.

PF-3.3: Water Pressure. Coordinate with local water districts and Orange County Fire Authority to encourage water pressures that remain high enough throughout all areas of the community to provided needed water capacity for fire protection.

PF-3.4: Emerging Technologies. Encourage service providers to explore the use of new technologies in the acquisition, treatment, distribution, and consumption of water including monitoring technologies, and other best practices.

PF-3.5: Educate the Public. Educate the public on water issues and conservation strategies, in partnership with water districts and regional partners; focus on business activities with the potential to pollute and distribute Best Management Practices (BMP) guidance for business activities.

PF-3.6: Water Conservation. Support water conservation measures that comply with state and federal legislation and that are consistent with measures adopted in all applicable Urban Water Management Plans.

PF-4.1: Statewide Requirements. Encourage water district compliance with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of sanitary sewer collection systems.

PF-4.2: Sewer Deposit Best Practices. Encourage wastewater service providers to identify and implement best practices and feasible technologies for wastewater collection and treatment, including those that reduce the amount of wastewater requiring treatment, prevent contamination, maintain the highest possible energy efficiency, and reduce costs and greenhouse gas (GHG) emissions.

PF-4.3: Reduced System Demand. Reduce wastewater system demand by encouraging water-conserving designs and equipment, encouraging water-conserving devices, and designing wastewater systems to minimize inflow and infiltration.

PF-4.4: Recycled Water. Work with water districts and end users to increase and maximize the use of recycled water for existing and future needs as new technology, funding, and infrastructure is available.

PF-4.5: Service Levels. Coordinate with water districts on proposed land use changes so that they can plan for adequate delivery of services to future development in Lake Forest.

PF-4.6: Public Education. Collaborate with water districts in developing a public education program that teaches residents and businesses how to help maintain a safe and clean wastewater system, such as by limiting the amount of oils, pesticides, and toxic chemicals entering the sewer system.

PF-5.3: Stormwater Runoff. Encourage that stormwater be directed towards permeable surfaces to allow for more percolation of stormwater into the ground.

PF-5.4: Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rain water for non-potable uses in compliance with applicable State regulations.

PF-5.5: Recycled Water. Explore the expansion of infrastructure for recycled stormwater for irrigation and other non-potable uses when safe, financially feasible, and available.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.

PF-5.8: County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

Impact 3.9-3: General Plan implementation could alter the existing drainage pattern in a manner which would result in substantial erosion, siltation, flooding, impeded flows, or polluted runoff (Less than Significant)

The City is split by the jurisdictional boundaries of 2 RWQCBs. The northwestern portions of the city fall under the requirements of the Santa Ana RWQCB, and the southeastern portions of the City fall under the requirements of the San Diego RWQCB. The jurisdictional boundaries are defined by the geographic division of watersheds; however, the boundary line can roughly be delineated by El Toro Road.

On May 19, 2009, the Santa Ana RWQCB adopted Order No. R8-2009-0030, NPDES No. CAS618030. In 2013, the SDRWQCB adopted Order No. R9-2013-0001 as amended by orders R9-2015-0001 and R9-2015-0100, NPDES No. CAS0109266. These Municipal NPDES Permits require the permittees (including the County of Orange, Orange County Flood Control District, and all of the cities of Orange County), to continue to implement stormwater quality management programs and develop additional programs in order to control pollutants in stormwater discharges.

In general accordance with Municipal NPDES Permits referenced above, the Model WQMP was developed by the County of Orange, the Orange County Flood Control District, and cities of Orange County (the permittees) to aid the permittees and development project proponents with addressing post-construction urban runoff and stormwater pollution from new development and significant redevelopment projects. The Model WQMP describes the process for developing a Project WQMP for individual new development and significant redevelopment projects. A Project WQMP is a plan for minimizing the adverse effects of urbanization on site hydrology, runoff flow rates and pollutant loads.

General Plan implementation has the potential to impact the Planning Area's storm drainage system. The potential impacts would be primarily derived from development in what are now underdeveloped and/or underutilized areas.

Construction activities are regulated by the NPDES General Construction Storm Water Permit. Compliance with the storm water permit during construction activities requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP) that contains BMPs to control the discharge of pollutants, including sediment, into local surface water drainages. Additionally, the City, in accordance with its approved Phase II Storm Water Management Program, must implement Post-Construction Storm Water Management in new development and redevelopment.

A gradual increase in impervious cover associated with new development could increase operational storm water runoff. In addition to complying with the NPDES programs and WQMP stormwater requirments, the General Plan contains policies and actions to reduce impacts associated with stormwater and drainage including policies to maintain sufficient levels of storm drainage service, improvements to flood control facilities, and other best practices in order to protect the community from flood hazards, and minimize the discharge of materials into the storm drain system that are toxic, or which could obstruct flows. Additionally, the General Plan policies encourage that stormwater be directed towards permeable surfaces, incorporate stormwater capture, and promote BMPs and Low Impact Development measures (LID) to treat stormwater.

Individual future projects developed after adoption of the General Plan would create new impervious surfaces. This would result in an incremental reduction in the amount of natural soil surfaces available for infiltration of rainfall and runoff, potentially generating additional runoff during storm events. In addition, the increase in impervious surfaces, along with the increase in surface water runoff, could increase the non-point source discharge of pollutants. Anticipated runoff contaminants include sediment, pesticides, oil and grease, nutrients, metals, bacteria, and trash. Contributions of these contaminants to stormwater and non-stormwater runoff would degrade the quality of receiving waters. During the dry season, vehicles and other urban activities release contaminants onto the impervious surfaces, where they can accumulate until the first storm event. During this initial storm event, or first flush, the concentrated pollutants would be transported via runoff to stormwater drainage systems. Contaminated runoff waters could flow into the stormwater drainage systems that discharge into rivers, agricultural ditches, sloughs, and channels, and ultimately could degrade the water quality of any of these water bodies. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below, as well as the City's adopted Municipal Code requirements, which are described in greater detail under Impact 3.9-1 above.

The General Plan sets policies and actions for build-out of the City, but it does not envision or authorize any specific development project. Because of this, the site-specific details of potential future development projects are currently unknown and analysis of potential impacts of such projects is not feasible and would be speculative. As previously discussed in the Regulatory Setting section of this chapter, future project applicants would be required to obtain permits from the Army Corps of Engineers and the Department of Fish and Wildlife if any work is performed within a

waterway. Each future development project must also include detailed project specific floodplain and drainage studies that assess the drainage characteristics and flood risks so that an appropriate storm drainage plan can be prepared to control storm water runoff, both during and after construction. The drainage plan will ultimately include project specific best management measures that are designed to allow for natural recharge and infiltration of stormwater. Construction of storm drainage improvements would occur as part of an overall development or infrastructure project, and is considered in the environmental impacts associated with project construction and implementation as addressed throughout this EIR.

The City manages local storm drain facilities and the Orange County Flood Control District (OCFCD) is responsible for regional flood control planning within the County. Provision of stormwater detention facilities as needed would reduce runoff rates and peak flows. The City has developed the General Plan to include policies and actions that, when implemented, will reduce flooding from new development, reduce storm water pollution from new development, and protect and enhance natural storm drainage and water quality features, which will in turn reduce water quality impacts. As described previously, existing regulatory requirements including NPDES and Waste Discharge permits from the RWQCB and implementation of BMPs manage quality. Through implementation of the General Plan policies and actions listed below, implementation of the Lake Forest Municipal Code requirements identified above, compliance with mandatory Federal and State regulations, and compliance with the existing regulations for the San Diego Creek and Aliso Creek Watersheds would ensure that impacts related to increased flooding or water quality impacts associated with increased runoff would be mitigated to a **less than significant level**.

GENERAL PLAN POLICIES AND ACTION THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PF-3.5: Educate the Public. Educate the public on water issues and conservation strategies, in partnership with water districts and regional partners; focus on business activities with the potential to pollute and distribute Best Management Practices (BMP) guidance for business activities.

PF-4.1: Statewide Requirements. Encourage water district compliance with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of sanitary sewer collection systems.

PF-4.2: Sewer Deposit Best Practices. Encourage wastewater service providers to identify and implement best practices and feasible technologies for wastewater collection and treatment, including those that reduce the amount of wastewater requiring treatment, prevent contamination, maintain the highest possible energy efficiency, and reduce costs and greenhouse gas (GHG) emissions.

PF-4.3: Reduced System Demand. Reduce wastewater system demand by encouraging water-conserving designs and equipment, encouraging water-conserving devices, and designing wastewater systems to minimize inflow and infiltration.

PF-4.4: Recycled Water. Work with water districts and end users to increase and maximize the use of recycled water for existing and future needs as new technology, funding, and infrastructure is available.

PF-4.5: Service Levels. Coordinate with water districts on proposed land use changes so that they can plan for adequate delivery of services to future development in Lake Forest.

PF-4.6: Public Education. Collaborate with water districts in developing a public education program that teaches residents and businesses how to help maintain a safe and clean wastewater system, such as by limiting the amount of oils, pesticides, and toxic chemicals entering the sewer system.

PF-5.1: Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.

PF-5.2: Data Collection. Encourage the Orange County Flood Control District to map, track, and analyze data on all current storm drain facilities in order to provide clear and accurate forecasts for future demand.

PF-5.3: Stormwater Runoff. Encourage that stormwater be directed towards permeable surfaces to allow for more percolation of stormwater into the ground.

PF-5.4: Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rain water for non-potable uses in compliance with applicable State regulations.

PF-5.5: Recycled Water. Explore the expansion of infrastructure for recycled stormwater for irrigation and other non-potable uses when safe, financially feasible, and available.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.

PF-5.8: County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

ACTION

PF-5a: Continue to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased beyond pre-development levels during rain and flood events.

Impact 3.9-4: General Plan implementation would not release pollutants due to project inundation by flood hazard, tsunami, or seiche. (Less than Significant)

FLOOD

The Planning Area is subject to limited flooding problems along the natural creeks, drainages, and lakes in the Planning Area. The FEMA FIRM for the Planning Area is shown on Figure 3.9-3. As shown in Figure 3.9-3, only a small area within Lake Forest is located within a mapped portion of either the 100-year or 500- year FEMA flood zones. The areas documented to be subject to 100-year and 500-year flooding within Lake Forest are located along Aliso Creek, Serrano Creek, Borrego Canyon Wash, San Diego Creek, and the lakes. Risk of flooding along these areas is limited, since flooding within this location would be likely to only affect a small area outside of the normal creek bed. The largest area of Lake Forest within the 100-year and 500-year FEMA flood zones is along the Aliso Creek bed and bike trail near Heroes Park along the eastern edge of the City.

The General Plan would allow development and improvement projects that would involve some land clearing, grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. As required by the Clean Water Act, each subsequent development project or improvement project will require an approved Storm Water Pollution Prevention Plan (SWPPP) that includes best management practices for grading and preservation of topsoil. SWPPPs are designed to control storm water quality degradation to the extent practicable using best management practices during and after construction.

As described previously in the Regulatory Setting, the City of Lake Forest regulates storm water discharge in accordance with the NPDES permit through Chapter 15.14 of the Lake Forest Municipal Code, Stormwater Quality Management. Additionally, Chapter 8.30 provides erosion control and protection measures, and Chapter 8.70 includes standards for flood damage prevention and floodplain management.

In addition to complying with the NPDES programs and WQMP stormwater requirements, the General Plan contains policies to reduce impacts associated with stormwater and drainage including policies to maintain sufficient levels of storm drainage service, improvements to flood control facilities and channel segments, and other best practices in order to protect the community from flood hazards and minimize the discharge of materials into the storm drain system that are toxic. The implementation of the General Plan would result in a **less than significant impact** relative to this topic.

TSUNAMI AND SEICHES

Tsunamis and seiches are standing waves that occur in the ocean or relatively large, enclosed bodies of water that can follow seismic, landslide, and other events from local sources (California,

Oregon, Washington coast) or distant sources (Pacific Rim, South American Coast, Alaska/Canadian coast).

Lake Forest is located approximately 5 miles from the Pacific Ocean at an elevation of approximately 489 feet above mean sea level. Based on tsunami inundation maps prepared by the Department of Conservation, California Emergency Management Agency, and California Geological Survey the City is not identified as being within a tsunami inundation or run-up zone.

Seiches are typically caused when strong winds and rapid changes in atmospheric pressure push water from one end of a body of water to the other. When the wind stops, the water rebounds to the other side of the enclosed area. The water then continues to oscillate back and forth for hours or even days. In a similar fashion, earthquakes, tsunamis, or severe storm fronts may also cause seiches along ocean shelves and ocean harbors, or other bodies large of water. Any body of water may experience limited oscillation during storm events or following seismic events, however oscillation in small bodies of water is generally limited. In smaller water bodies seiches may have the potential to damage or overtop dams. Generally in lakes the threat of large-scale damage from seiches comes from downstream flooding that would be caused by large volumes of water overtopping a dam or reservoir. As described previously, there are no dam inundation areas in the City of Lake Forest. As such, the City is not at significant risk from a dam failure. In addition, limited isolated damage to adjacent and down-slope structures has been observed from seiches occurring in swimming pools and in small shallow lakes and ponds. Man-made lakes within the Planning Area are shallow with limited surface areas, and would not generate devastating seiches. The City of Lake Forest is not within a tsunami hazard area and would not be subject to substantial impacts from seiche events. This is a **less than significant** impact and no mitigation is required.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

PS-3.1: Regulatory Compliance. Coordinate with local, state, and federal agencies to ensure that the City's regulations related to flood control are in compliance with federal, State, and local standards.

PS-3.2: FEMA Coordination. Coordinate with the Federal Emergency Management Agency (FEMA) to ensure that Federal Insurance Rate Maps correctly depict flood hazards in the City.

PS-3.3: Municipal Code. Implement the standards and requirements defined in the Municipal Code to reduce flood hazards and address flood-prone areas within Lake Forest.

PS-3.4: Existing Flood Zones. Maintain dialogue with the County of Orange regarding regional flood facilities.

PS-3.5: Changing Conditions. Coordinate with the Orange County Flood Control District to consider the need to expand the capacity of flood control facilities based on changing flood conditions associated with climate change and extreme weather.

PS-3.6: Mitigation. Require that all new developments and redevelopments in areas susceptible to flooding incorporate mitigation measures designed to reduce flood hazards.

PS-3.7: Adequate Infrastructure. Maintain and regularly assess the status of local storm drainage infrastructure to ensure that the system can adequately reduce flood hazards.

PS-3.8: Public Awareness. Promote public education and information dissemination on flooding hazards to help property owners protect their homes and businesses from flood damage.

PF-5.1: Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.

PF-5.2: Data Collection. Encourage the Orange County Flood Control District to map, track, and analyze data on all current storm drain facilities in order to provide clear and accurate forecasts for future demand.

PF-5.3: Stormwater Runoff. Encourage that stormwater be directed towards permeable surfaces to allow for more percolation of stormwater into the ground.

PF-5.4: Stormwater Capture. Encourage the use of stormwater capture methods, such as rain barrels, to aid in the reuse of rain water for non-potable uses.

PF-5.5: Recycled Water. Explore the expansion of infrastructure for recycled stormwater for irrigation and other non-potable uses when safe, financially feasible, and available.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.

PF-5.8: County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

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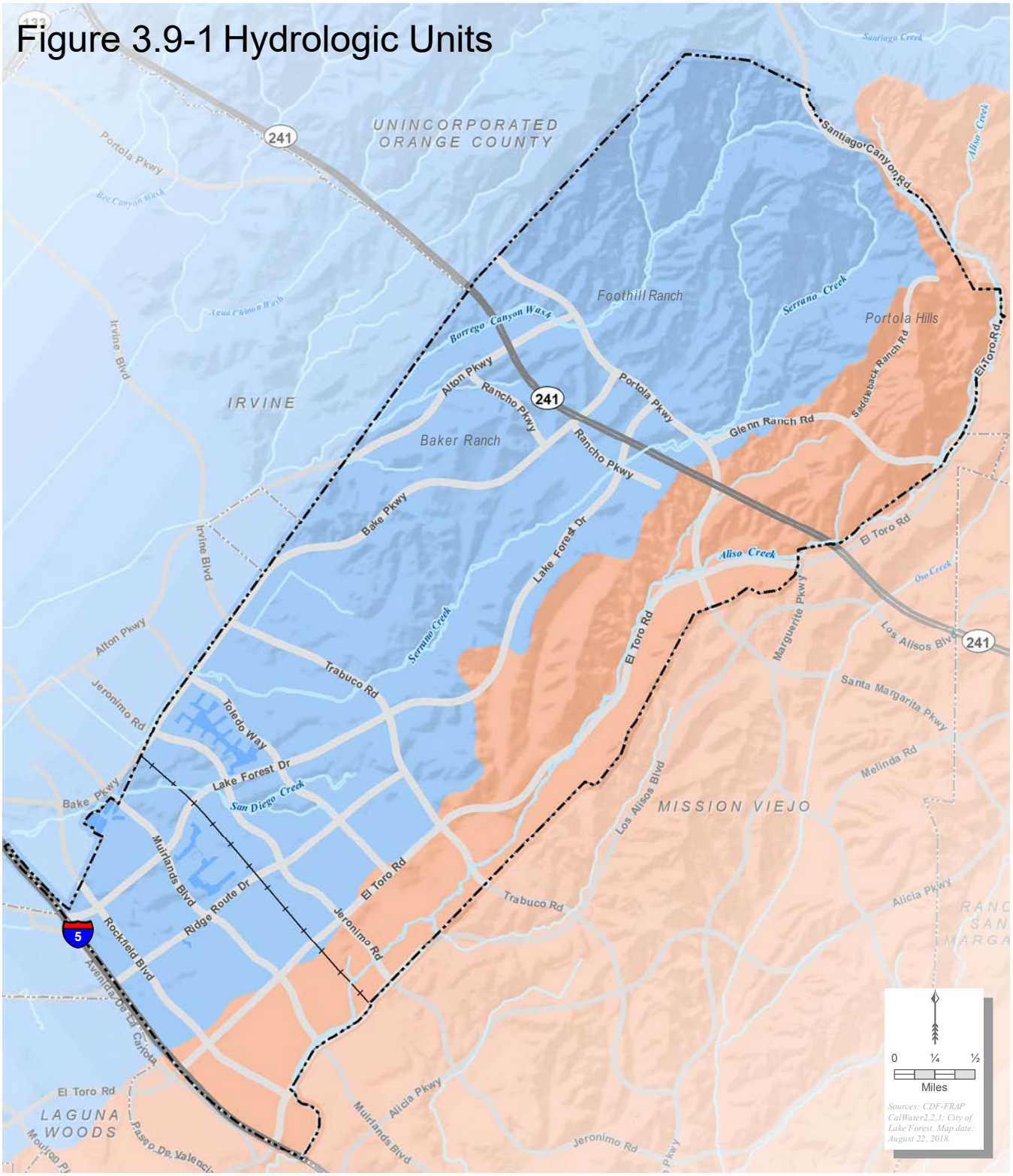
Figure 3.9-1 Hydrologic Units



Legend

City of Lake Forest

Hydrologic Unit Name

San Juan

Santa Ana River

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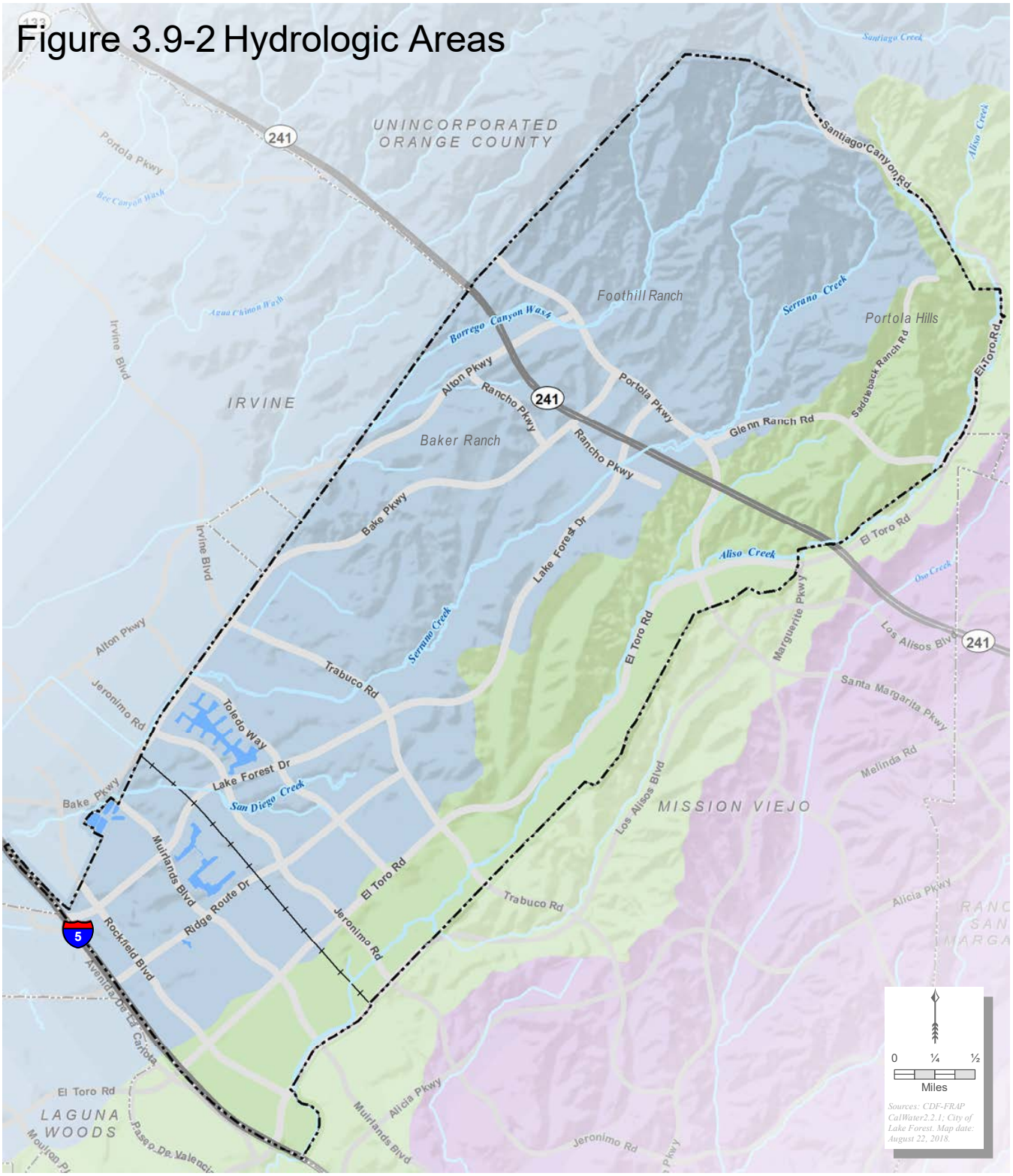
Figure 3.9-2 Hydrologic Areas



Legend

City of Lake Forest

Hydrologic Area Name

Laguna

Lower Santa Ana River

Mission Viejo

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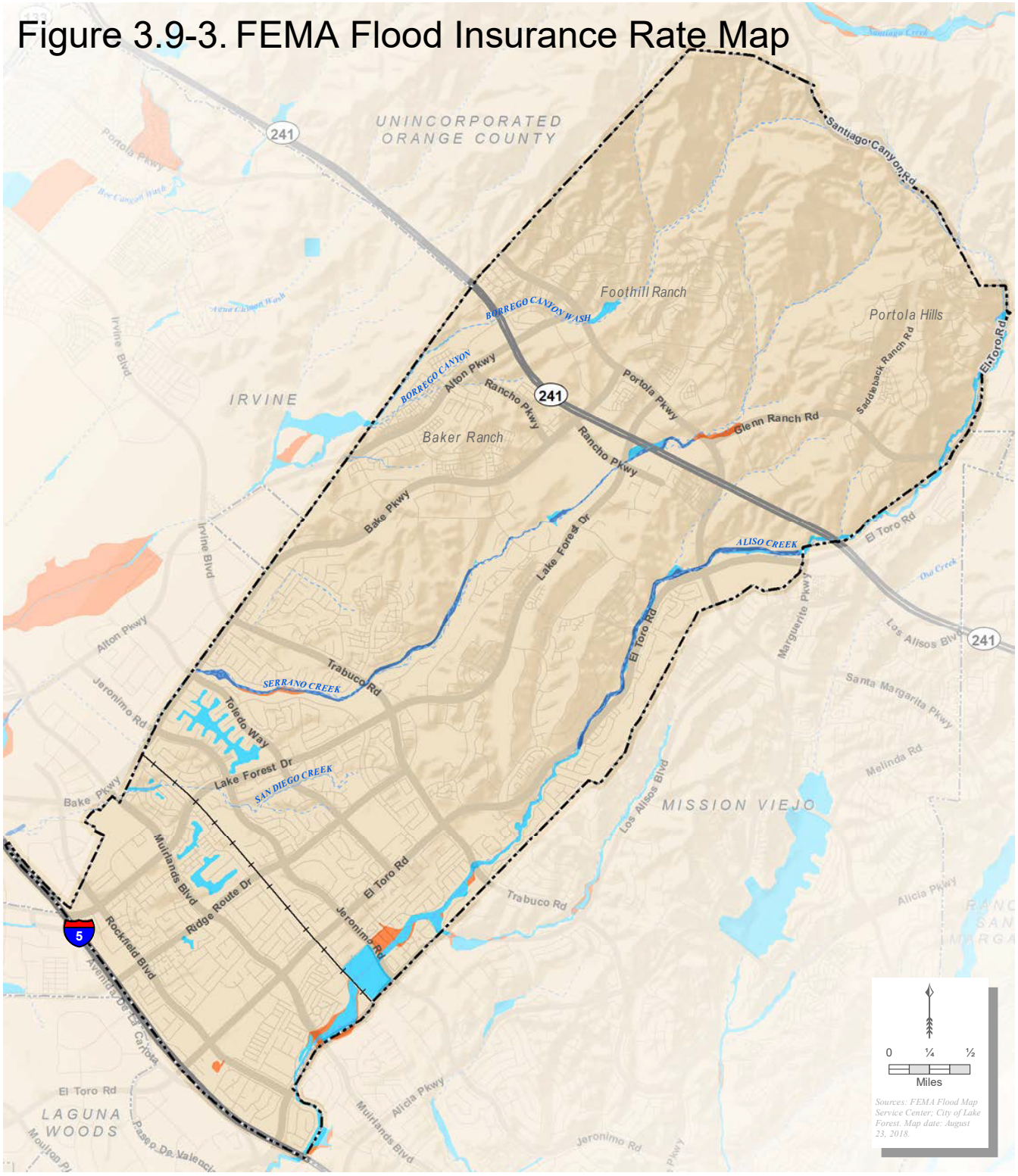
Figure 3.9-3. FEMA Flood Insurance Rate Map



Legend

City of Lake Forest

FEMA Flood Hazard Zones

- 1% Annual Chance Flood Hazard (100-year Flood)
- 0.2% Annual Chance Flood Hazard (500-year Flood)
- Regulatory Floodway
- Area of Minimal Flood Hazard

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This section identifies the existing land use conditions, discusses population and housing trends and projections, analyzes the project's consistency with relevant planning documents and policies adopted for the purpose of avoiding or mitigating an environmental effect, and recommends mitigation measures to avoid or minimize the significance of potential environmental impacts. General Plan policies associated with other specific environmental topics are discussed in the relevant sections of this EIR.

No comments on this environmental topic were received during the NOP comment period.

3.10.1 ENVIRONMENTAL SETTING

EXISTING CONDITIONS

The City Limits includes the area within the City's corporate boundary, over which the City exercises land use authority and provides public services. A City's Sphere of Influence (SOI) is the probable physical boundary and service area of a local agency, as adopted by a Local Agency Formation Commission (LAFCO). An SOI may include both incorporated and unincorporated areas within which a city or special district will have primary responsibility for the provision of public facilities and services. Lake Forest's SOI is contiguous with its City Limits. For the purposes of the Lake Forest General Plan Update, the Planning Area is defined as the area within the City's SOI/City Boundary that is included in the analysis and planning for the approximate 20-year horizon of the City's General Plan Update.

The City's boundary has expanded significantly since the City was incorporated and the first General Plan was prepared. In the early 2000s, the City annexed areas north of the Foothill Transportation Corridor within its SOI, including Portola Hills and Foothill Ranch, resulting in its contiguous City boundary and SOI. Figure 3.10-1 shows the Lake Forest Planning Area boundary.

Land Use Patterns

When discussing land use, it is important to distinguish between planned land uses and existing land uses. The current General Plan land use designations identify the long-term planned use of land, but do not necessarily present a complete picture of existing land uses. The Orange County Assessor's office maintains a database of existing "on-the-ground" land uses on individual parcels. This information is used as the basis for property tax assessments and is summarized in Table 3.10-1 and depicted on Figure 3.10-2.

Existing land uses refers to the existing built environment, which may be different from the land use or zoning designations applied to land in the City for planning purposes. Existing land uses are based on data provided by the County Assessor and are described below.

TABLE 3.10-1 EXISTING LAND USES

CATEGORY	*PARCEL COUNT*	*ACRES*	*% OF TOTAL ACRES*
Open-Space and Recreation	695	3,174	35.0%
Single Family Residential	15,230	2,247	24.5%
Roadways (parcelized and non-parcelized)	130	1,718	16.0%
Vacant[1]	510	800	8.7%
Multi-Family Residential	644	676	7.4%
Commercial and Services	323	502	5.5%
Industrial	177	435	5.0%
General Office	110	215	2.4%
Mixed Commercial and Industrial	206	191	2.1%
Agriculture	18	192	2.1%
Education	17	156	1.7%
Facilities	33	148	1.6%
Transportation, Communication, and Utilities	39	118	1.3%
Mobile Homes	11	92	1.0%
Water	42	70	0.77%
Mixed Residential	80	7	0.08%
Grand Total	18,265	10,742	100%

NOTE: [1] ACCORDING TO THE ORANGE COUNTY ASSESSOR'S OFFICE, A NUMBER OF CURRENTLY APPROVED AND UNDER DEVELOPMENT PROJECTS ARE IDENTIFIED AS "VACANT". THESE PROJECTS INCLUDE THE NEW CIVIC CENTER AND PORTIONS OF BAKER RANCH AND PORTOLA HILLS. WHEN THESE AREAS ARE EXCLUDED FROM THE QUALIFICATION OF VACANT LAND, IT BECOMES CLEAR THAT THERE IS VERY LITTLE VACANT UNENTITLED/UNPLANNED LAND LEFT IN THE CITY OF LAKE FOREST.
SOURCE: ORANGE COUNTY ASSESSOR'S OFFICE, 2018; DE NOVO PLANNING GROUP, 2018.

RESIDENTIAL

Residential uses in Lake Forest include single-family houses, multi-family developments, mobile homes, and mixed-density residential. Single family residential is the second most dominant land use type in the City (after open space and recreation), accounting for 24.5 percent of the City's land area. Single family residential land uses are located throughout the City, as shown on Figure 3.10-2.

Multi-family residential refers to parcels that contain more than one housing unit, and attached structures including duplexes, triplexes, fourplexes, condominiums, townhomes, and apartment buildings. The predominant type of multi-family developments in Lake Forest include low-rise apartments, condos, and townhomes.

Mobile home communities account for 92 acres in Lake Forest and only make up 1.0 percent of all acreage in the City. Similarly, mixed residential only makes up 0.08 percent of all City acreage and consists of seven acres.

COMMERCIAL AND SERVICES

Commercial and services uses make up 5.5 percent (502 acres) of the total acres within the City. Commercial uses, as identified by the County Assessor, are varied. The predominant type of

commercial land use, based on acreage, is retail centers with off-street parking other than strip commercial (268 acres). Retail strip development is the second most dominant commercial land use at 152 acres. As shown on Figure 3.10-2, many of the City's commercial uses are located along and around the City's major transportation corridors. Mixed commercial and industrial is also present within the City of Lake Forest (191 acres).

INDUSTRIAL

Industrial manufacturing exists across a total of 435 acres, making up 5.0 percent of the City's land uses. Industrial manufacturing uses include heavy industrial (seven acres), light industrial (12 acres), manufacturing (0.19 acres), manufacturing, assembly, industrial services (404 acres), and research and development (10 acres). Manufacturing, assembly, and industrial services account for 93 percent of land use designated as Industrial within Lake Forest. Figure 3.10-2 shows Industrial uses throughout the City.

OFFICE

Offices uses include general office use and low and medium rise office use in Lake Forest. Office development includes approximately 215 acres of land. Office uses are located throughout the City as shown on Figure 3.10-2.

EDUCATION

Education uses include educational institutions, elementary schools, pre-schools and day care centers, and senior high schools totaling 155 acres. Elementary schools represent the most development in the education category with 112 acres of land. The category with the second highest amount of development is senior high schools, which includes 40 acres. Education uses are located throughout the City as shown on Figure 3.10-2.

AGRICULTURE LAND

The Agriculture land category includes general agricultural uses, horse ranches, nurseries, and other agriculture. Agriculture land makes up 2.1 percent (191 acres) of the City's total acreage.

OPEN SPACE AND RECREATION

The open space and recreation category of land uses is the most dominant land use category within Lake Forest. Open space and recreation accounts for 35 percent (3,173 acres) of all land acreage. The open space and recreation category includes cemeteries, golf courses, local parks and recreation, other open space and recreation, regional parks and recreation. The regional parks and recreation category is the predominant open space and recreation land use, constituting up 48 percent of the acres within the entire category.

TRANSPORTATION COMMUNICATION AND UTILITIES

The transportation communication and utilities category includes communication facilities, electrical facilities, Freeways and major roads, improved flood waterways and structures, liquid

waste disposal facilities, railroads, water storage facilities, and water transfer facilities. The transportation communication and utilities uses include 117 acres within the City.

VACANT LANDS

Vacant land is generally unused land. Vacant land makes up 800 acres on 510 parcels, and accounts for approximately 8.7 percent of the total assessed area of the City. Lands in this category are typical void of structures. Note that the Assessor's Office has continued to identify the new Civic Center and areas of Baker Ranch and Portola Hills, which are currently under development, as "Vacant". When these areas are removed from the summary of available "Vacant" land, the total amount of vacant land is considerably less.

FACILITIES

The category of facilities includes fire stations, government offices, public facilities, religious facilities, special care facilities, and other public Facilities. 147 acres of land across 33 parcels in Lake Forest are designated for facilities. The religious facilities category is the most dominant subcategory of facilities within Lake Forest, making up approximately 86 percent of facility acreage.

Projects Under Review

The projects under review in the City are shown in Table 3.10-2.

TABLE 3.10-2: CITY OF LAKE FOREST PROJECTS UNDER REVIEW

PROJECT NAME	*LOCATION*	*DESCRIPTION*
Saddleback Church Expansion	1 Saddleback Parkway	New 92,391 SF worship center, addition of 26,924 SF classroom, and associated site improvements
Amara at Serrano Summit	S of Commercecentre Dr, between Civic Center Dr and Serrano Summit Dr	101 single family homes in conjunction with TTM 18162 in the previously-approved Serrano Summit residential development
Soria at Serrano Summit	S of Commercecenter Dr, between Civic Center Dr and Serrano Summit Dr	108 townhome condominium homes in conjunction with TTM 18162 in the previously-approved Serrano Summit residential development
Teresina Development	North of Trabuco Road, East of Bake Parkway, northern end of Peachwood	Amendment to Site Development Permit 2008-11 for 85 single family homes in Tract 15594
Coffee Bean	22441 El Toro Rd	New 1,710 SF drive-through restaurant
Boys and Girls Club	N/A	Request to identify requirements for locating a Boys and Girls Club at El Toro Community Park
Great Scott Contractor's Storage Yard	20865 Canada Rd	GPA and Zone Change from OS to LI to establish a contractor storage yard use
Worship Uses	23061 and 23071 El Toro Rd	Two new 3,312 SF single-story buildings to be used as places of worship
Nakase Nursery Redevelopment	APN 612-221-01 at Bake Parkway and Rancho Parkway	Application to allow development of 122-acre site into a mixed-use development with an elementary school, senior affordable rental housing, parks,

PROJECT NAME	LOCATION	DESCRIPTION
		open space, 4-5 residential products ranging from 5-13 du/ac with approximately 600-800 units.

SOURCE: CITY OF LAKE FOREST, 2018.

Population and Households

As shown in Table 3.10-3, Lake Forest has experienced significant growth over the last nine years. A large amount of this growth is through development of most of the remaining "greenfield" areas within its SOI and annexations of several large contiguous communities (e.g., Foothill Ranch and Portola Hills, which when annexed in 2010, had 3,500 and 2,200 units, respectively). Specifically, the City's population grew by 11.6 percent between 2010 and 2019, outpacing the County (7.1 percent). Lake Forest's population currently represents about 2.7 percent of the total for the County.

TABLE 3.10-3: POPULATION AND HOUSEHOLD GROWTH TRENDS

CATEGORY	LAKE FOREST			ORANGE COUNTY		
	2010	2019	% CHANGE	2010	2019	% CHANGE
Total Population	77,395	86,346	11.6%	3,010,232	3,222,498	7.1%
Total Households	76,880	85,831	11.6%	2,964,214	3,171,663	7.0%

SOURCE: U.S. CENSUS; AMERICAN COMMUNITY SURVEY; ECONOMIC & PLANNING SYSTEMS; DEPARTMENT OF FINANCE, E-5.

For the City, the Southern California Association of Governments (SCAG) projects a 16 percent population growth between 2012 and 2040, from 78,500 to 90,700 people, similar to the County (13 percent). Likewise, employment growth in Lake Forest is forecast to keep pace with that of the County, at around 25 percent over the 28-year period.

It is important to note that the SCAG projections, which are compiled using a number of sources including adopted plans, historical trends, and interviews with local jurisdictions, tend to be more accurate on a regional level than on a local or city level. It is likely that through a combination of market changes, catalytic projects, updated land use direction in the General Plan, and other factors, Lake Forest could capture either more or less of expected regional growth than forecasted by SCAG.

Housing Units

The growth in Lake Forest housing supply mirrored population trends, with a 39 percent increase in inventory since 2000 (compared with 24 percent and 11 percent inventory growth for Trade Area[1] and County respectively). The City's housing supply is strongly oriented to single-family

[1] The Trade Area represents the immediate geography in which Lake Forest broadly competes for retail shoppers, home buyers and renters, commercial tenants, and office and manufacturing employers. Trade Area boundaries are geographical features that tend to focus a large share of regional circulation and economic activity within. Lake Forest is within a ten-city Trade Area, which includes the cities of Aliso Viejo, Costa Mesa, Irvine, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, San Juan Capistrano, and Tustin. These Trade Area boundaries are defined based on geographical mobility considerations that tend to focus a large share of regional economic activity.

homes with 71 percent classified as either detached or attached single-family. Notably, Lake Forest's share of multi-family homes (25 percent) is below that of the County (33 percent), although the proportion of mobile homes is slightly above the County average.

The rate of homeownership in Lake Forest is also relatively high with owner-occupied homes making up 68 percent of the total in 2016, compared with 55 percent in the County. Note that about 20 percent of multi-family units are owner-occupied (condominiums), which is higher than the County (11 percent).

TABLE 3.10-4: HOUSING SUPPLY, MIX, GROWTH, AND OWNERSHIP, LAKE FOREST, TRADE AREA, AND ORANGE COUNTY

	2016				
	SINGLE-FAMILY (DETACHED)	*SINGLE-FAMILY (ATTACHED)*	*MULTIFAMILY*	*MOBILE HOME/OTHER*	*TOTAL*
Lake Forest	**15,648**	**4,515**	**7,153**	**1,152**	**28,468**
2000-2016 Unit Growth	43%	59%	32%	-11%	39%
Share by Type	55%	16%	25%	4%	100%
Vacancy	8%	1%	7%	0%	4%
Owner-Occupied	86%	74%	19%	95%	68%
Trade Area[2]	**145,508**	**50,523**	**108,947**	**5,456**	**310,434**
2000-2016 Unit Growth	21%	11%	40%	-10%	24%
Share by Type	47%	16%	35%	2%	100%
Vacancy	3%	3%	7%	6%	5%
Owner-Occupied	83%	70%	11%	81%	56%
Orange County	**545,239**	**126,732**	**352,548**	**29,306**	**1,053,825**
2000-2016 Unit Growth	11%	2%	16%	-6%	11%
Share by Type	52%	12%	33%	3%	100%
Vacancy	4%	5%	7%	6%	5%
Owner-Occupied	80%	65%	11%	71%	55%

NOTES: [1] CALCULATION FROM BASE OF ALL UNITS INCLUDING VACANT UNITS.
[2] TRADE AREA INCLUDES LAKE FOREST, ALISO VIEJO, COSTA MESA, IRVINE, LAGUNA HILLS, LAGUNA NIGUEL, MISSION VIEJO, RANCHO SANTA MARGARITA, SAN JUAN CAPISTRANO, TUSTIN
SOURCE: U.S. CENSUS; AMERICAN COMMUNITY SURVEY; ECONOMIC & PLANNING SYSTEMS.

3.10.2 REGULATORY SETTING

STATE

California General Plan Law

Government Code Section 65300 requires that each county and city adopt a General Plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning."

The General Plan will include a comprehensive set of goals, policies, and actions (implementation measures), as well as a revised Land Use Map. It is a comprehensive long-term plan for the physical development of the county or city and is considered a "blueprint" for development. The General Plan must contain seven state-mandated elements: Land Use, Open Space, Conservation, Housing, Circulation, Noise, and Safety. It may also contain any other elements that the county or city wishes to include. The land use element designates the general location and intensity of designated land uses to accommodate housing, business, industry, open space, education, public buildings and grounds, recreation areas, and other land uses.

The 2017 General Plan Guidelines, established by the Governor's Office of Planning and Research (OPR) to assist local agencies in the preparation of their general plans, further describe the mandatory land use element as a guide to planners, the general public, and decision makers prescribing the ultimate pattern of development for the county or city.

Regional Housing Needs Plan

California law requires each city and county to have land zoned to accommodate a "fair share" of the regional housing need. The State determines the fair-share allocated to each region, which is known as the Regional Housing Needs Allocation (RHNA). SCAG developed a RHNA allocation plan for the City. The City's Housing Element, adopted in January 2014, accommodates the City's 2014-2021 RHNA. The total housing growth need for the City of Lake Forest identified for the 2014-2021 planning period is 2,727 units. SCAG is in the process of developing the 6th cycle RHNA allocation plan which will cover the planning period October 2021 through October 2029 and will be considering adoption of the plan in October 2020.

Regional Transportation Plan/Sustainable Communities Strategy

SCAG approved its most-recent Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) in April 2016, which outlines the long-range vision and the region's transportation system investments through 2040. The Plan charts a course for closely integrating land use and transportation – so that the region can grow smartly and sustainably. It outlines more than $556.5 billion in transportation system investments through 2040. The Plan was prepared through a collaborative and comprehensive process with input from local governments, county transportation commissions, tribal governments, non-profit organizations, businesses and local stakeholders within the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino and Ventura.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was developed to protect the quality of the environment and the health and safety of persons from adverse environmental effects. Discretionary projects are required to be reviewed consistent with the requirements of CEQA to determine if there is potential for the project to cause a significant adverse effect on the environment. Depending on the type of project and its potential effects, technical traffic, noise, air quality, biological resources, and geotechnical reports may be needed. If potential adverse effects can be mitigated to less than significant levels, a mitigated negative declaration may be adopted. If potentially adverse effects cannot be mitigated to less than significant levels, an environmental impact report is required. These documents have mandated content requirements and public

review times. Preparation of CEQA documents can be costly and time-consuming, potentially extending the processing time of a project by a year or longer.

Subdivision Code

A subdivision is any division of land for the purpose of sale, lease or finance. The State of California Subdivision Map Act (Government Code § 66410) regulates subdivisions throughout the state. The goals of the Subdivision Map Act are as follows:

- To encourage orderly community development by providing for the regulation and control of the design and improvement of a subdivision with proper consideration of its relationship to adjoining areas.
- To ensure that areas within the subdivision that are dedicated for public purposes will be properly improved by the subdivider so that they will not become an undue burden on the community.
- To protect the public and individual transferees from fraud and exploitation.

The Map Act allows cities flexibility in the processing of subdivisions. Lake Forest controls this process through the subdivision regulations in the Municipal Code Title 7 (referred to as the Lake Forest Subdivision Code). These regulations ensure that minimum requirements are adopted for the protection of the public health, safety and welfare; and that the subdivision includes adequate community improvements, municipal services, and other public facilities.

LOCAL

City of Lake Forest Zoning Ordinance

Title 9 of the Lake Forest Municipal Code is the City's Planning and Zoning Ordinance. The Planning and Zoning Ordinance carries out the policies of the General Plan by classifying and regulating the uses of land and structures within the City, consistent with the General Plan. The Planning and Zoning Ordinance is adopted to protect and promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents and businesses in the City.

Zoning provides a legal mechanism for local government regulation of the land uses described in the General Plan Land Use Map. In addition to providing specific regulations related to minimum lot size, building heights, setbacks, lot coverage, etc., for each zoning district, the Zoning Ordinance also lists the uses that would be acceptable or could be considered in each district, as well as those that would be considered unacceptable. For some uses, further regulations are established. Zoning regulations designate the permitting process that applies for approval of land uses in the zoning district.

Planned Communities

Before incorporation, the City was primarily developed as a series of Planned Communities, including Lake Forest, El Toro, Baker Ranch, Pacific Commercentre, Rancho de los Alisos, Rancho Serrano, Serrano Highlands, Foothill Ranch, and Portola Hills. Following incorporation, additional Planned Communities were approved, including Serrano Summit and Portola Center. Pre-incorporation development agreements apply to a number of the Planned Communities in Lake

Forest and identify permitted levels of development based on the provision of public facilities and infrastructure. The land use designations identified in the Current Land Use Element are consistent with the development densities identified in the development agreements. Figure 3.10-4 shows the Planned Communities in Lake Forest.

Opportunities Study

In 2003, the City of Lake Forest initiated the Opportunities Study to study the implications of re-designating and re-zoning vacant land within the City that was entitled for business and industrial use on five properties in Lake Forest (Shea Baker Ranch, Portola Center, Serrano Summit, The Pinnacle, and Whistler Ranch). The proposed re-designation and re-zoning would allow for a new plan with residential uses and facilities such as a Sports Park and Civic Center.

The Opportunities Study focused on approximately 800 acres of what was then vacant land located in the City of Lake Forest, north and south of the Foothill Transportation Corridor and adjacent to the former Marine Corps Air Station El Toro. The study area was formerly encumbered by the 65 Community Noise Equivalent Level contours, which imposed land use restrictions due to the aircraft noise generated by airplanes taking off from the former Marine base.

In 2008, the City Council certified the Opportunities Study Final Program Environmental Impact Report, and approved a General Plan Amendment and zone changes for approximately 800 acres of land located near the 241 Toll Road.

Local Agency Formation Commission of Orange County

In 1963, the State Legislature created a LAFCO for each county, with the authority to regulate local agency boundary changes. Subsequently, the State has expanded LAFCO authority. The goals of a LAFCO include preserving agricultural and open space land resources and providing for efficient delivery of services. The Orange County LAFCO has authority over land use decisions in the County of Orange affecting local agency boundaries. Its authority extends to the incorporated cities, including annexation of County lands into a city, and special districts within the County. The City of Lake Forest is adjacent to unincorporated areas of Orange County.

In addition, LAFCO conducts Municipal Service Reviews (MSRs) for services within its jurisdiction. An MSR typically includes a review of existing municipal services provided by a local agency and its infrastructure needs and deficiencies. It also evaluates financing constraints and opportunities, management efficiencies, opportunities for rate restructuring and shared facilities, local accountability and governance, and other issues.

Orange County Airport Land Use Commission

The Airport Land Use Commission (ALUC) was established to regulate development of areas surrounding public airports in Orange County. It is intended to minimize the public's exposure to excessive noise and safety hazards, and to ensure that the approaches to airports are kept clear of structures that could pose an aviation safety hazard.

Orange County ALUC has adopted a series of Airport Environs Land Use Plans (AELUPs) for each of the airports in Orange County which include John Wayne Airport (JWA), Fullerton Municipal

Airport (FMA) and Joint Forces Training Base Los Alamitos. Additionally, there is an AELUP for Heliports.

Under California Government Code Section 65302.3(a), General Plans must be consistent with any airport land use plan adopted pursuant to Public Utilities Code Section 21675. The City of Lake Forest is not within an Airport Influence Area for any Orange County airport, and as such, no significant compatibility issues between City planning issues and airport compatibility concerns are expected.

Orange County General Plan

Orange County adopted its current General Plan in 2005, and has adopted a number of amendments since that time. The County's General Plan provides a comprehensive set of goals, policies, and implementing actions to guide the County's growth. The County's General Plan includes the following elements: Land Use, Transportation, Public Services and Facilities, Resources, Recreation, Noise, Safety, Housing, and Growth Management.

3.10.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on land use and population if it will:

- Physically divide an established community;
- Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect;
- Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or
- Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

IMPACTS AND MITIGATION MEASURES

Impact 3.10-1: General Plan implementation would not physically divide an established community (Less than Significant)

The proposed General Plan establishes the City's vision for future growth and development. Goal LU-1 of the General Plan aims to achieve "*A community with a balanced land use pattern that meets the City's long-term housing, employment, and civic needs.*" The land uses allowed under the proposed General Plan (Figure 2.0-3) provide opportunities for cohesive new growth at in-fill locations within existing urbanized areas of the city, as well as new growth adjacent to existing urbanized areas, but would not create physical division within the community. New development and redevelopment projects would be designed to complement the character of the existing community and neighborhoods and provide connectivity between existing development and new development. The proposed General Plan Land Use Map designates sites for a range of urban and rural developed uses as well as open space. The proposed General Plan does not include any new

areas designated for urbanization or new roadways, infrastructure, or other features that would divide existing communities. The proposed General Plan would have a **less than significant** impact associated with the physical division of an established community. The policies listed below would ensure that future development is compatible with adjacent communities and land issues.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

LU-1.1: Land Use Pattern. Promote an appropriate land use plan that fosters and enhances community livability and public health; supports economic development; promotes efficient development and multiple transportation options; reduces pollution, greenhouse gas emissions, and the expenditure of energy and other resources; and ensures compatibility between uses.

LU-2.1: Physical Characteristic Compatibility. Ensure that new development fits within the existing community setting and is compatible with surrounding land uses and public infrastructure availability.

Impact 3.10-2: General Plan implementation would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect (Less than Significant)

STATE PLANS

The proposed General Plan was prepared in conformance with State laws and regulations associated with the preparation of general plans, including requirements for environmental protection. Discussion of the proposed General Plan's consistency with State regulations, plans, and policies associated with specific environmental issues (e.g., air quality, traffic, water quality, etc.) is provided in the relevant chapters of this Draft EIR. The State would continue to have authority over any State-owned lands in the vicinity of the city and the proposed General Plan would not conflict with continued application of State land use plans, policies, and regulations adopted to avoid or mitigate environmental effects.

CITY PLANS

As set forth by State law, the General Plan serves as the primary planning document for the City and subordinate documents and plans would be updated to be consistent with the General Plan. Similar to the existing General Plan, the proposed General Plan focuses on a balanced land use pattern, creating a community where new development blends with existing neighborhoods, and promoting the City as a desirable place to live and work. The proposed General Plan carries forward and enhances policies and measures from the City's existing General Plan that were intended for environmental protection and would not remove or conflict with City plans, policies, or regulations adopted for environmental protection. The proposed General Plan would require modifications to the City's Zoning Ordinance to provide consistency between the General Plan and zoning; however, these modifications will not remove or adversely modify portions of the Lake Forest Municipal Code that were adopted to mitigate an environmental effect.

Subsequent development and infrastructure projects would be required to be consistent with all applicable policies, standards, and regulations, including those land use plans, policies, and regulations adopted to mitigate environmental effects by the City as well as those adopted by agencies with jurisdiction over components of future development projects. Any potential environmental impact associated with conflicts with land use requirements would be **less than significant**. The policies listed below would ensure that the General Plan does not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

LU-2.8: Public Agency Impacts. Encourage affected public agencies to provide necessary facilities and services to support the impact and intensity of development in Lake Forest.

LU-5.5: Housing Element Consistency. In the City's focus areas, allow for residential development at or above densities established by the State of California to meet the objectives of the Housing Element.

Impact 3.10-3: General Plan implementation would not induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure) (Less than Significant)

The proposed General Plan accommodates future growth in Lake Forest, including new businesses, expansion of existing businesses, and new residential uses. Infrastructure and services would need to be extended to accommodate future growth. At full buildout, the proposed General Plan could accommodate approximately 22,406 new housing units and 12,410,885 square feet of new non-residential building square footage within the Planning Area compared to existing condition, as shown in Table 2.0-2 in Chapter 2.0. This new growth may increase the city's population by approximately 70,574 residents and 14,202 employees compared to the existing condition.

As shown in Table 2.0-2, the proposed General Plan would accommodate approximately 14,634 new housing units and 1,649,356 square feet of new non-residential building square footage within the Planning Area compared to the growth potential under the current General Plan. This new growth may increase the city's population by approximately 43,464 residents and 4,032 employees compared to the future buildout condition of the Current General Plan.

Depending on growth rates, the actual growth during the life of the General Plan could be lower or higher, but would not exceed the theoretical buildout described in Chapter 2.0.

Given the historical and current population, housing, and employment trends, growth in the city, as well as the entire state, is inevitable. The primary factors that account for population growth are natural increase and net migration. The average annual birth rate for California is expected to be 20 births per 1,000 population. Additionally, California is expected to attract more than one third of the country's immigrants. Other factors that affect growth include the cost of housing, the location of jobs, the economy, the climate, and transportation. While these factors would likely

result in growth in Lake Forest during the planning period of the proposed General Plan, growth will continue to occur based primarily on the demand of the housing market and demand for new commercial, industrial, and other non-residential uses. As future development occurs under the proposed General Plan, new roads, infrastructure, and services would be necessary to serve the development, and this infrastructure would accommodate planned growth. The proposed General Plan is intended to accommodate the City's fair share of statewide housing needs, which are allocated by the SCAG, based on regional numbers provided by the California Department of Housing and Community Development on a regular basis (every five to eight years).

The proposed General Plan includes policies and actions that mitigate environmental impacts associated with growth, such as air quality, noise, traffic, water supply, and water quality effects. Chapters 3.1 through 3.16 and 4.0 provide a discussion of environmental effects associated with development allowed under the proposed General Plan. Each of these EIR chapters include relevant policies and action items that would mitigate potential environmental impacts associated with growth, to the greatest extent feasible.

With implementation of General Plan policies and actions intended to guide growth to appropriate areas and provide services necessary to accommodate growth, the land uses allowed under the proposed General Plan, the infrastructure anticipated to accommodate proposed land uses, and the goal and policy framework would not induce growth that would exceed adopted thresholds, beyond those disclosed and analyzed throughout this EIR. Therefore, population and housing growth associated with the proposed General Plan would result a **less than significant** impact, as there are no additional potential environmental impacts, beyond those analyzed and disclosed in this EIR, that would result from growth accommodated by the proposed project. No additional mitigation is required.

Impact 3.10-4: General Plan implementation would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere (less than significant)

The majority of developed land in the Planning Area is comprised of residential uses, which are not anticipated to undergo significant land use changes under the Proposed Project. The Proposed Project focuses infill development opportunities in vacant and underutilized areas in Lake Forest, as well as areas currently developed with commercial uses which may transition to mixed uses in the future. The General Plan Land Use Map was developed to preserve existing neighborhoods throughout the City. Throughout the Planning Area, the Proposed Project is projected to increase the overall number of dwelling units and provide housing to serve the diverse needs of the community at various socioeconomic levels.

Therefore, impacts of the proposed General Plan on the displacement of people or housing are considered **less than significant** and no mitigation is required. The policies listed below would further ensure that a range of housing types are provided in the City, and that housing conditions are evaluated as the housing supply ages.

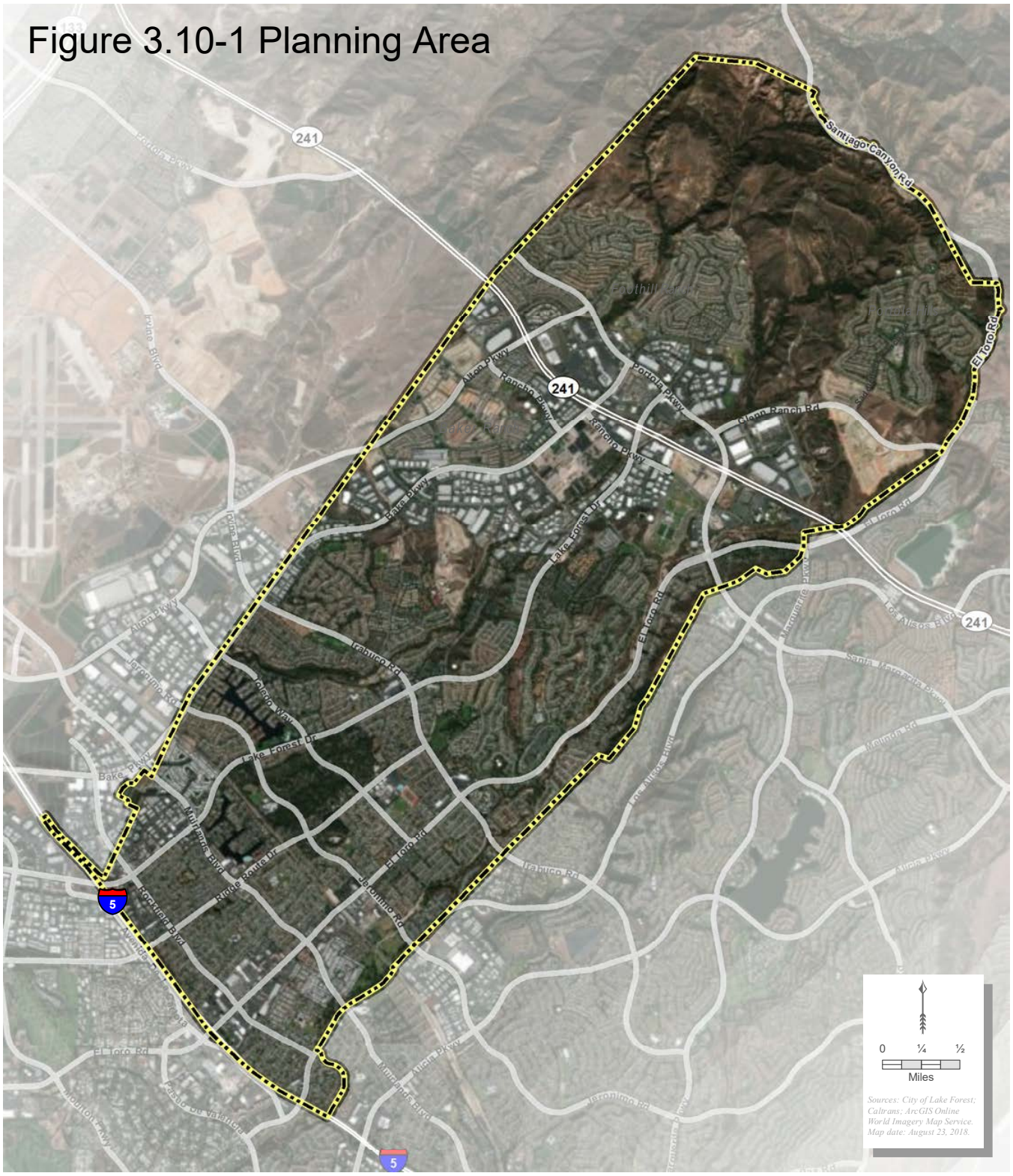
GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

HW-2.2: Housing Options. Promote a land use plan that allows for a range of housing types and affordability options to support healthy living for families of various incomes and sizes.

HW-2.3: Housing Conditions. Evaluate housing and neighborhood conditions as the housing supply ages in order to proactively address issues that may be detrimental to public health.

Figure 3.10-1 Planning Area



Legend

City of Lake Forest

Our Vision. Our Plan. Lake Forest 2040

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Our Vision. Our Plan. Lake Forest 2040

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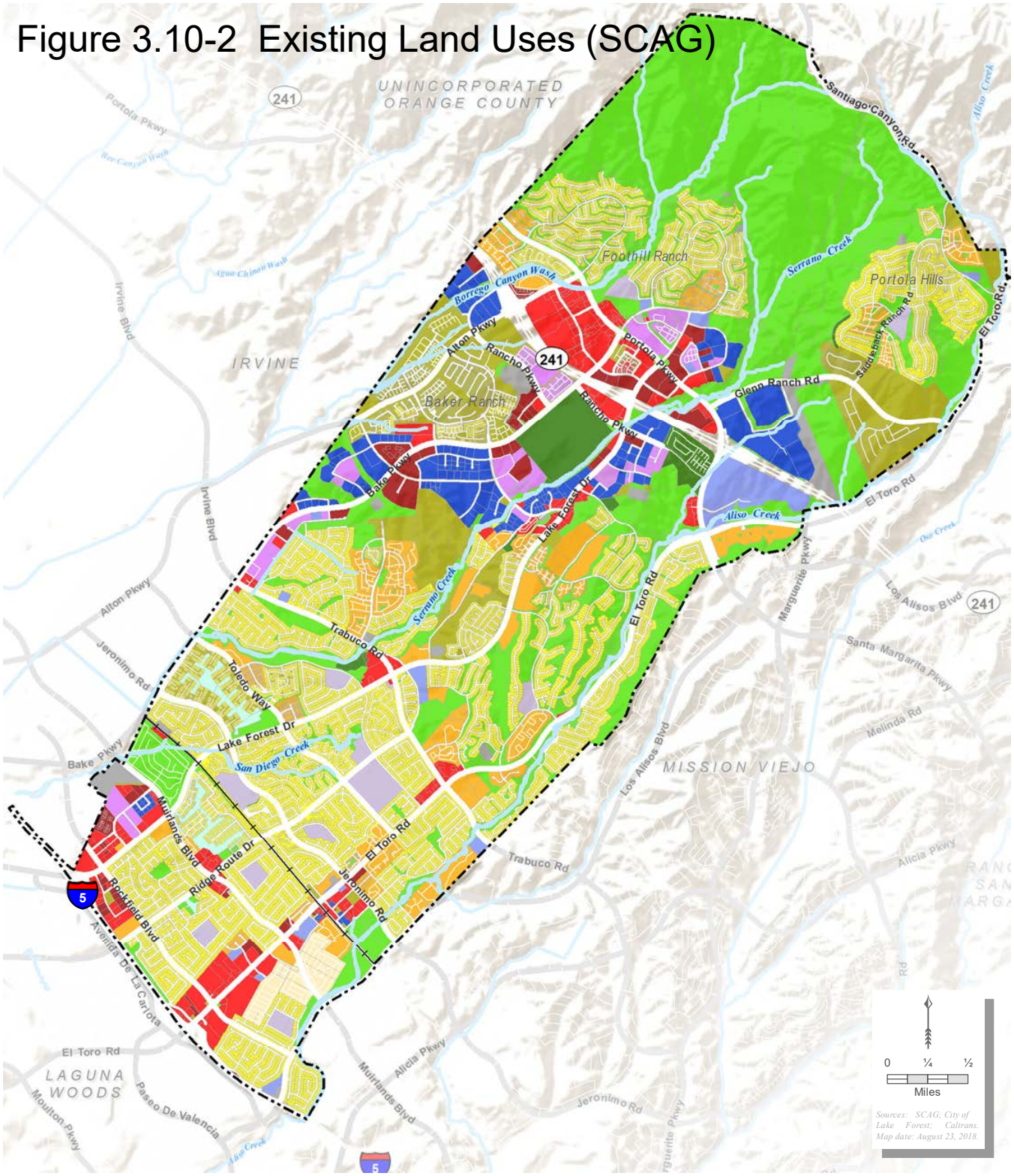
Figure 3.10-2 Existing Land Uses (SCAG)



- Single Family Residential
- Multi-Family Residential
- Mobile Homes and Trailer Parks
- Mixed Residential
- General Office
- Commercial and Services
- Facilities
- Education
- Industrial
- Transportation, Communications, and Utilities
- Mixed Commercial and Industrial
- Open Space and Recreation
- Agriculture
- Vacant
- Water

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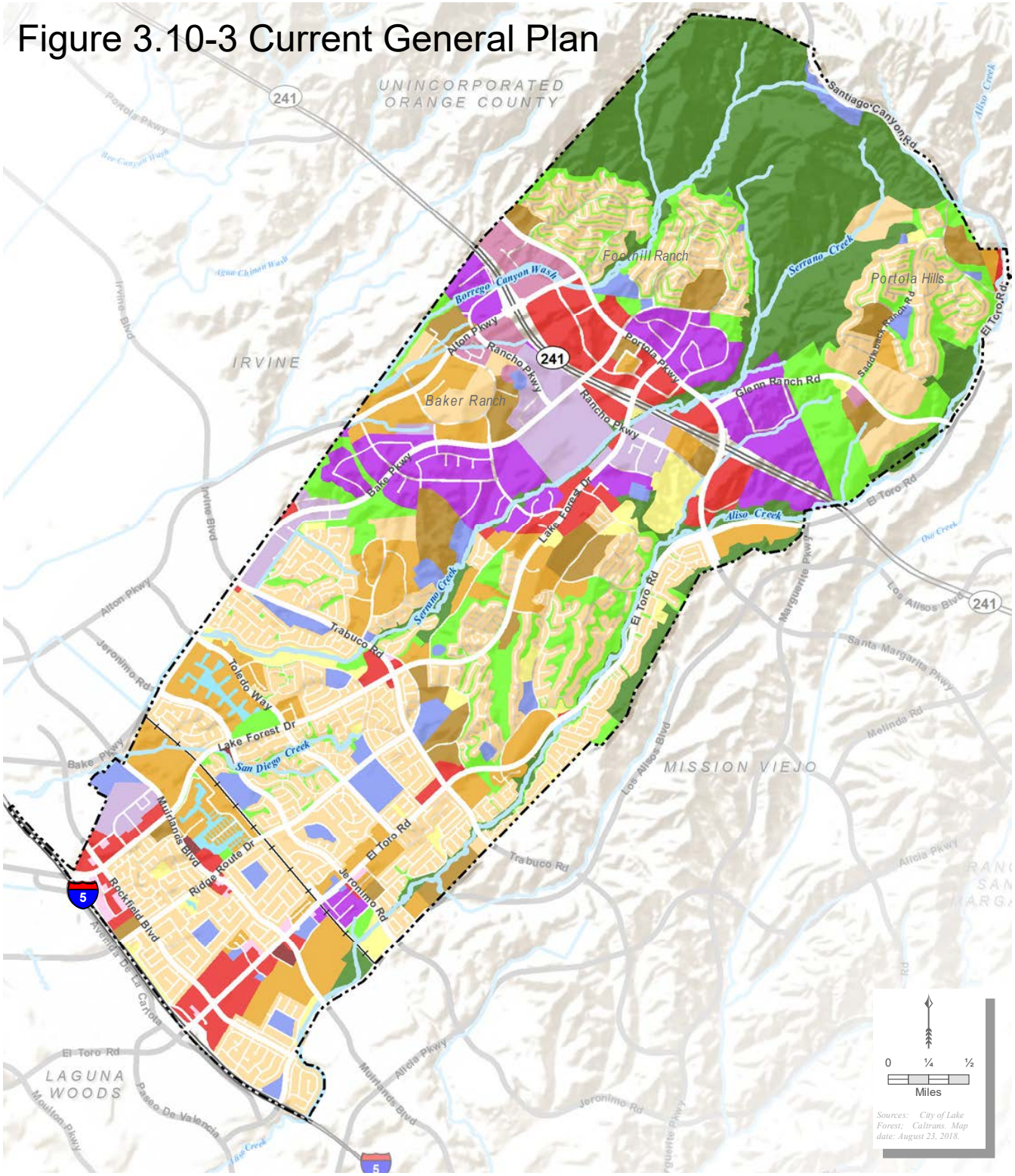
Figure 3.10-3 Current General Plan



Legend

- Low Density Residential
- Low-Medium Density Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Professional Office
- Mixed-Use
- Business Park
- Light Industrial
- Public Facility
- Community Park/Open Space
- Regional Park/Open Space
- Open Space
- Lake
- Transportation Corridor

Lake Forest 2040 — Our Vision. Our Plan.

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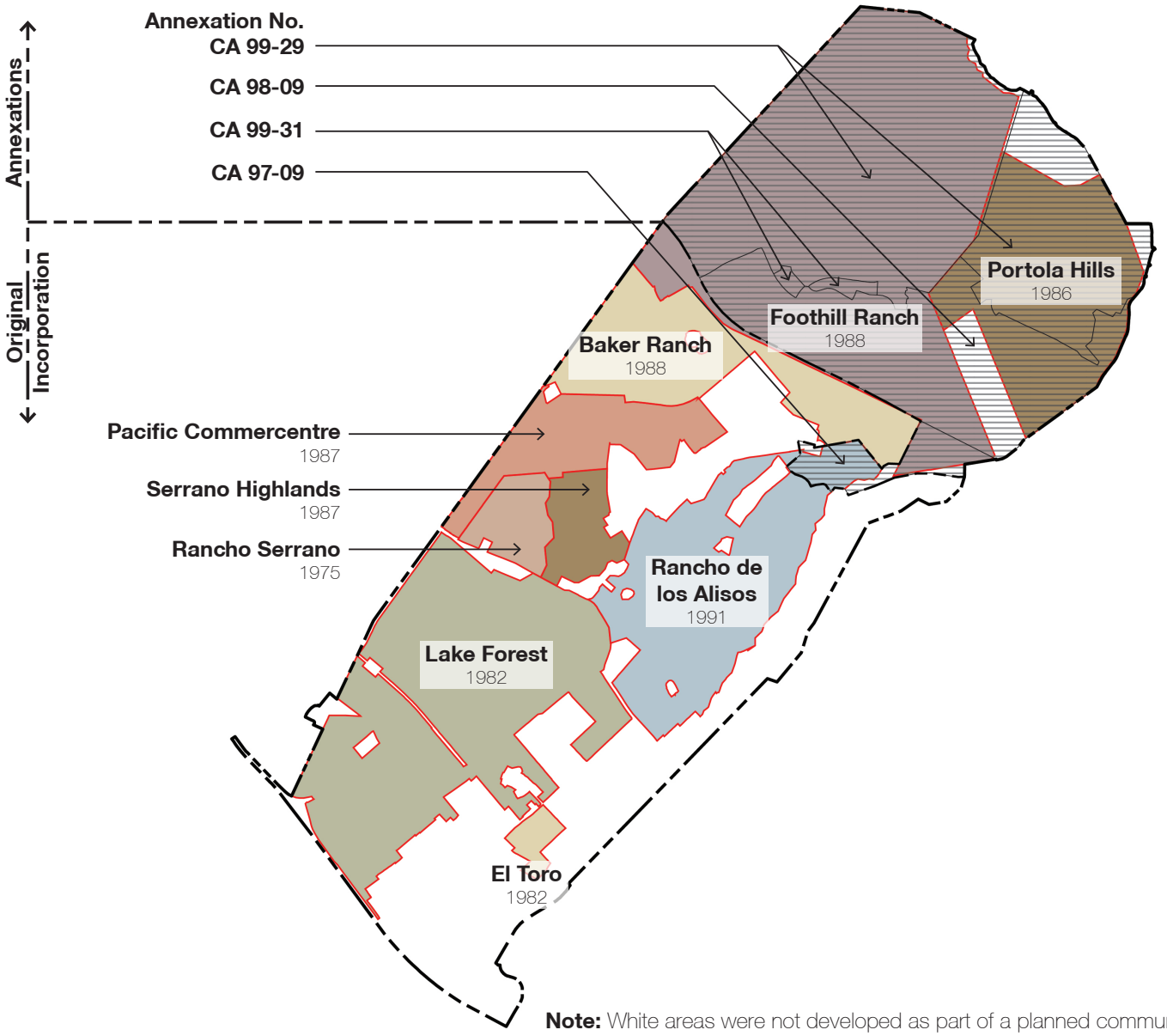
Figure 3.10-4 Planned Communities



Note: White areas were not developed as part of a planned community

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This section provides a background discussion and analysis of mineral and energy resources in Lake Forest. This section is organized with an environmental setting, regulatory setting, and impact analysis.

No comments were received on this environmental topic during the NOP comment period.

3.11.1 ENVIRONMENTAL SETTING

MINERAL RESOURCE CLASSIFICATION

Pursuant to Surface Mining and Reclamation Act (SMARA), the California State Mining and Geology Board oversees the mineral resource zone (MRZ) classification system. The MRZ system characterizes both the location and known/presumed economic value of underlying mineral resources. The mineral resource classification system uses four main MRZs based on the degree of available geologic information, the likelihood of significant mineral resource occurrence, and the known or inferred quantity of significant mineral resources. The four classifications are described in Table 3.11-1.

TABLE 3.11-1: MINERAL RESOURCE CLASSIFICATION SYSTEM

CLASSIFICATION	*DESCRIPTION*
MRZ-1	Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
MRZ-2	Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.
MRZ-3	Areas containing mineral deposits, the significance of which cannot be evaluated.
MRZ-4	Areas where available information is inadequate for assignment to any other MRZ classification.

SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION DIVISION OF MINES AND GEOLOGY, 2002.

MINERAL RESOURCES

Mineral resources include commercially viable oil and gas deposits, and nonfuel mineral resources deposits. Nonfuel mineral resources include metals such as gold, silver, iron, and copper; industrial metals such as boron compounds, rare-earth elements, clays, limestone, gypsum, salt, and dimension stone; and construction aggregate, including sand, gravel, and crushed stone. California is the largest producer of sand and gravel in the nation.

According to Orange County's existing General Plan, Orange County has a significant amount of mineral resources. As identified in California Geological Survey's Special Report 143, Parts III and IV, for the Orange County Region, the areas classified and designated as deposits containing significant sand and gravel resources are located in portions of the Santa Ana River, Santiago Creek, San Juan Creek, Arroyo Trabuco, as well as other scattered areas. The California Geological Survey also identifies fire clay and industrial sand as having historically been produced in large quantities within Orange County.

Orange County is located in the State of California Department of Conservation's Santa Ana 30' x 60' Quadrangle (the Santa Ana quadrangle). The Santa Ana quadrangle includes some of the most complex and varied terrain in the United States. The California Geological Survey estimates that there is demand for 1,079 million tons and current permitted reserves of 862 million tons of supply over the next fifty years (California Geological Survey, 2018).

In addition to the County, the City of Lake Forest contains many important natural resources and features, including mineral resource areas and other open lands. Extractions of mineral resources in the City of Lake Forest include sand and gravel. According to the City's existing General Plan, approximately 62 acres of land in the eastern portion of the City is designated as MRZ-2. The MRZ-2 resource area in the eastern portion of the City was previously mined for sand and gravel materials by the El Toro Materials Sand and Gravel Operation. This aggregate mining operation is no longer active, and the area has since been developed. Specifically, the area is classified as an important MRZ for Portland cement concreate (PCC) grade aggregate by the State Department of Conservation (DOC). PCC-grade aggregate is valuable in Southern California where it used for a variety of construction purposes.

LOCATION OF PERMITTED AGGREGATE MINES

The California Office of Mine Reclamation periodically publishes a list of qualified permitted aggregate mines regulated under SMARA that is generally referred to as the AB 3098 List. The Public Contract Code precludes mining operations that are not on the AB 3098 List from selling sand, gravel, aggregates or other mined materials to State or local agencies. As of August 21, 2018, there are two aggregate mines on the AB 3098 list in Orange County: Lapeyre Industrial Sands, Inc; and Ortega Rock. Neither of the two listed mines are within the City of Lake Forest.

3.11.2 REGULATORY SETTING

STATE

Surface Mining and Reclamation Act of 1975

The California Department of Conservation Surface Mining and Reclamation Act of 1975 (§ 2710), also known as SMARA, provides a comprehensive surface mining and reclamation policy that permits the continued mining of minerals, as well as the protection and subsequent beneficial use of the mined and reclaimed land. The purpose of SMARA is to ensure that adverse environmental effects are prevented or minimized and that mined lands are reclaimed to a usable condition and are readily adaptable for alternative land uses. The production and conservation of minerals are encouraged, while also giving consideration to values relating to recreation, wildlife, range and forage, as well as aesthetic enjoyment. Residual hazards to public health and safety are eliminated. These goals are achieved through land use planning by allowing a jurisdiction to balance the economic benefits of resource reclamation with the need to provide other land uses.

If a use is proposed that might threaten the potential recovery of minerals from an area that has been classified MRZ-2, SMARA would require the jurisdiction to prepare a statement specifying its reasons for permitting the proposed use, provide public notice of these reasons, and forward a

copy of the statement to the State Geologist and the State Mining and Geology Board (Cal. Pub. Res. Code Section 2762). Lands classified MRZ-2 are areas that contain identified mineral resources.

LOCAL

Lake Forest Municipal Code

The existing Lake Forest Municipal Code contains Chapter 9.150 (Surface Mining and Land Reclamation Regulations), which includes provisions for regulating surface mining and quarrying, and the processing of these materials, consistent with SMARA.

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project may have a significant impact on the environment associated with mineral resources if it would:

1. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
2. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

IMPACTS AND MITIGATION MEASURES

Impact 3.11-1: General Plan implementation would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state (Less than Significant)

Within the Planning Area, mineral resources include sand and gravel. Approximately 62 acres of land in the eastern portion of the City is designated as MRZ-2. The MRZ-2 resource area, previously known as the El Toro Materials Sand and Gravel Operation, in the eastern portion of the City was previously excavated for sand and gravel materials. The area is classified as an important MRZ for PCC grade aggregate by the DOC. PCC-grade aggregate is valuable in Southern California where it used for a variety of construction purposes. However, the El Toro Materials Sand and Gravel Operation is no longer operational. The 62-acre area designated as MRZ-2 is currently developed with residential uses, a baseball field, and a storm drain basin. As such, the 62-acre area is no longer available for mining.

Given that the only known MRZ in Lake Forest has already been mined and then subsequently developed, there is no additional potential for resource extraction from this MRZ. There are no other known mineral deposits or resources within Lake Forest that are of significant value to the region or the state. As such, implementation of the proposed General Plan would have a **less than significant** impact on this environmental topic, and no mitigation is required.

Impact 3.11-2: General Plan implementation would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan (Less than Significant)

The Planning Area does not contain a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. As noted above, the El Toro Materials Sand and Gravel Operation is no longer operational. The 62-acre area designated as MRZ-2 is currently developed and is no longer available for mining. The proposed project would not result in loss of a mineral resource. Therefore, this impact is considered **less than significant** and no additional mitigation is necessary.

This section provides a discussion of the regulatory setting, a general description of existing noise sources in Lake Forest, and a discussion of the impacts and mitigation measures associated with implementation of the proposed General Plan. The analysis in this section was prepared with assistance from Saxelby Acoustics. The technical data in support of this EIR section is presented in Appendix E.

There were no comments received during the NOP comment period related to this environmental topic.

3.12.1 ENVIRONMENTAL SETTING

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Attenuation	The reduction of noise.
A-Weighted, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for sound in air is 20 micro-pascals.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sounds are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
L_{eq}	The average A-weighted noise level during the measurement period.

L_{max}/L_{min}	The maximum and minimum A-weighted noise levels during the measurement period.
$L_{(n)}$	The A-weighted noise levels that are exceeded n% of the time during the measurement period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro-pascals (or 20 micro Newtons per square meter), where 1 pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro-pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micro-pascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is "half as loud" as an 80 dBA sound, and "twice as loud" as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptors L_{dn} and CNEL, and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10 decibel weighting applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it de-emphasizes short-term variations in the noise environment. CNEL is similar to L_{dn}, but includes a +5 dB penalty for evening noise. Table 3.12-1 lists several examples of the noise levels associated with common situations.

TABLE 3.12-1: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	*NOISE LEVEL (DBA)*	*COMMON INDOOR ACTIVITIES*
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. NOVEMBER 2009.

Effects of Noise on People

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn}. At an L_{dn} of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about 25-30 percent of the population. There

is an increase of about two percent per dBA between an L_{dn} of 60-70 dBA. Between an L_{dn} of 70-80 dBA, each decibel increase results in about a three percent increase of the population being highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately 30-35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about three percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a four percent increase in the percentage of the population highly annoyed.

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential noise standards for multi-family dwellings and other attached housing including transient occupancies are set by the State at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12-17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57-62 dBA L_{dn} with open windows and 65-70 dBA L_{dn} if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, rooms facing secondary roadways need to be able to have their windows and doors closed, while those facing major roadways and freeways typically need special windows and doors with a high sound attenuation rating.

FUNDAMENTALS OF VIBRATION

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several methods are typically used to quantify the amplitude of vibration, including Peak Particle Velocity (PPV) and Root Mean Square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. RMS velocity is defined as the average of the squared amplitude of the signal. PPV is normally used to evaluate structural damage, while PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Low-level vibrations can cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

In suburban environments, such as Lake Forest, sources of ground-borne vibration include construction activities, rail transit, and heavy trucks and buses.

Construction Vibration

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the peak particle velocity descriptor (PPV) has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.2 to 0.3 mm/sec (0.008 to 0.012 inches/sec), PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels such as people in an urban environment may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to a building is very rare and has only been observed in instances where the structure is in a high state of disrepair and the construction activity (e.g., impact pile driving) occurs immediately adjacent to the structure.

Table 3.12-2 displays continuous vibration impacts on human annoyance and on buildings. As discussed previously, annoyance is a subjective measure and vibrations may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying.

TABLE 3.12-2: REACTION OF PEOPLE AND DAMAGE TO BUILDINGS FOR CONTINUOUS VIBRATION LEVELS

VELOCITY LEVEL, PPV (IN/SEC)	*HUMAN REACTION*	*EFFECT ON BUILDINGS*
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

SOURCE: TRANSPORTATION- AND CONSTRUCTION-INDUCED VIBRATION GUIDANCE MANUAL, CALIFORNIA DEPARTMENT OF TRANSPORTATION, JUNE 2004.

Light-Rail/ Heavy-Rail Vibration

Rail operations are potential sources of substantial ground-borne vibration depending on distance, the type and the speed of trains, and the type of railroad track. People's response to ground-borne vibration has been correlated best with the velocity of the ground. The velocity of the ground is expressed on the decibel scale. The reference velocity is 1 x 10-6 in. /sec. RMS, which equals 0 VdB, and 1 in. /sec. equals 120 VdB. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration decibels to reduce the potential for confusion with sound decibels.

Typical background vibration levels in residential areas are usually 50 VdB or lower, well below the threshold of perception for most humans. Perceivable vibration levels inside residences are attributed to the operation of heating and air conditioning systems, door slams, and foot traffic. Construction activities (in particular, pile driving for taller buildings in certain soil conditions), train operations, and street traffic are some of the most common external sources of perceptible vibration inside residences. Table 3.12-3 identifies some common sources of vibration, corresponding VdB levels, and associated human perception and potential for structural damage.

TABLE 3.12-3: LEVELS OF GROUNDBORNE VIBRATION

HUMAN/STRUCTURAL RESPONSE	*VELOCITY LEVEL, VDB*	*TYPICAL EVENTS (AT 50 FEET)*
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment, heavy tracked vehicles (bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	90	Commuter rail, upper range
Residential annoyance, infrequent	80	Rapid transit, upper range
Residential annoyance, occasional		Commuter rail, typical bus or truck over bump or on rough roads
Residential annoyance, frequent	70	Rapid transit, typical
Approximate human threshold of perception to vibration	60	Buses, trucks and heavy street traffic Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	

SOURCE: TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT, US DEPARTMENT OF TRANSPORTATION FEDERAL TRANSIT ADMINISTRATION, MAY 2006.

One of the problems with developing suitable criteria for ground-borne vibration is the limited research into human response to vibration and, more importantly, human annoyance inside buildings. The U.S. Department of Transportation (Federal Transit Administration) has developed rational vibration limits that can be used to evaluate human annoyance to ground-borne vibration. These criteria are primarily based on experience with passenger train operations, such as rapid transit and commuter rail systems. The main difference between passenger and freight operations is the time duration of individual events; a passenger train lasts a few seconds, whereas a long freight train may last several minutes, depending on speed and length.

Heavy Trucks and Buses

Ground-borne vibration levels from heavy trucks and buses are not normally perceptible, especially if roadway surfaces are smooth. Buses and trucks typically generate ground-borne vibration levels of about 63 VdB at a distance of 25 feet when traveling at a speed of 30 mph. Higher vibration levels can occur when buses or trucks travel at higher rates of speed or when the pavement is in poor condition. Vibration levels below 65 VdB are generally below the threshold for human perception.

EXISTING NOISE LEVELS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction model (FHWA-RD 77-108) was used to develop community noise equivalent level (CNEL) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA model predicts hourly L_{eq} values for free-flowing traffic conditions and is generally considered to be accurate within 1.5 dB. To predict CNEL values, it is necessary to determine the day/evening/night distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the General Plan study area. Day/evening/night traffic distributions were based upon continuous hourly noise measurement data. Caltrans vehicle truck counts were obtained for Interstate 5 and Route 241. Arterial roadway truck percentages were obtained from vehicle classification count data provided by the traffic engineer. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 3.12-4 shows the results of this analysis.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segments. In some locations sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 3.12-4 are generally considered to be conservative estimates of noise exposure along roadways in the City of Lake Forest Lake Forest.

TABLE 3.12-4: PREDICTED EXISTING TRAFFIC NOISE LEVELS

ROADWAY SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, LDN)[1]	DISTANCES TO TRAFFIC NOISE CONTOURS, LDN (FEET)		
		60 DB	65 DB	70 DB
Alton Pkwy (Portola Pkwy to SR-241)	57.3	141	66	30
Alton Pkwy (SR-241 to Rancho Pkwy)	67.0	320	149	69
Alton Pkwy (Rancho Pkwy to Commercentre Dr)	68.0	408	190	88
Alton Pkwy (Commercentre Dr to Irvine Blvd)	64.6	483	224	104
Bake Pkwy (Portola Pkwy to Rancho Pkwy)	69.2	350	162	75
Bake Pkwy (Dimension Dr to Commercentre Dr)	60.8	385	178	83
Bake Pkwy (Commercentre Dr to Irvine Blvd/Trabuco Rd)	64.1	401	186	86
Bake Pkwy (Irvine Blvd/Trabuco Rd to Toledo Way)	66.5	498	231	107
Bake Pkwy (Toledo Way to Jeronimo Rd)	63.5	519	241	112
Commercentre Dr (Alton Pkwy to Bake Pkwy)	67.7	180	84	39
Commercentre Dr (east of Bake Pkwy)	65.8	184	85	40
Commercentre Dr (south of Dimension Dr)	61.4	125	58	27
Dimension Dr (Bake Pkwy to Commercentre Dr)	60.5	108	50	23
Dimension Dr (Commercentre Dr to Lake Forest Dr)	63.3	167	77	36
El Toro Rd (north of Glenn Ranch Rd)	61.7	233	108	50
El Toro Rd (Glenn Ranch Rd to Marguerite Pkwy)	62.3	286	133	62
El Toro Rd (Marguerite Pkwy to Portola Pkwy/Santa Margarita Pkwy)	63.1	273	127	59
El Toro Rd (south of Portola Pkwy/Santa Margarita Pkwy)	64.8	402	187	87
El Toro Rd (north of Trabuco Rd)	68.3	396	184	85
El Toro Rd (Trabuco Rd to Toledo Way)	66.1	438	203	94
El Toro Rd (Toledo Way to Jeronimo Rd)	72.5	440	204	95
El Toro Rd (Jeronimo Rd to Muirlands Blvd)	70.6	455	211	98
El Toro Rd (Muirlands Blvd to Rockfield Blvd)	64.2	310	144	67
El Toro Rd (Rockfield Blvd to I-5)	68.2	350	163	75
Glenn Ranch Rd (north of Portola Pkwy)	59.7	238	110	51
Glenn Ranch Rd (west of El Toro Rd)	56.1	137	64	30
Jeronimo Rd (Bake Pkwy to Lake Forest Dr)	63.1	173	80	37
Jeronimo Rd (Lake Forest Dr to Ridge Route Dr)	60.6	141	66	30
Jeronimo Rd (Ridge Route Dr to El Toro Rd)	62.1	148	69	32
Jeronimo Rd (El Toro Rd to Los Alisos Blvd)	64.1	201	93	43
Lake Forest Dr (Portola Pkwy to SR-241)	64.1	189	88	41

ROADWAY SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, LDN)[1]	DISTANCES TO TRAFFIC NOISE CONTOURS, LDN (FEET)		
		60 DB	65 DB	70 DB
Lake Forest Dr (SR-241 to Rancho Pkwy)	66.7	280	130	60
Lake Forest Dr (Rancho Pkwy to Dimension Dr)	65.9	310	144	67
Lake Forest Dr (Dimension Dr to Trabuco Rd)	65.7	410	190	88
Lake Forest Dr (Trabuco Rd to Toledo Way)	65.6	382	177	82
Lake Forest Dr (Toledo Way to Jeronimo Rd)	65.9	398	185	86
Lake Forest Dr (Jeronimo Rd to Muirlands Blvd)	65.4	398	185	86
Lake Forest Dr (Muirlands Blvd to Rockfield Blvd)	63.4	273	127	59
Lake Forest Dr (Rockfield Blvd to I-5)	68.7	379	176	82
Los Alisos Blvd (north of Jeronimo Rd)	63.9	295	137	63
Los Alisos Blvd (Jeronimo Rd to Muirlands Blvd)	63.6	301	140	65
Los Alisos Blvd (Muirlands Blvd to Rockfield Blvd)	64.1	281	130	61
Los Alisos Blvd (south of Rockfield Blvd)	65.9	267	124	57
Muirlands Blvd (Bake Pkwy to Lake Forest Dr)	61.7	181	84	39
Muirlands Blvd (Lake Forest Dr to Ridge Route Dr)	63.0	206	96	44
Muirlands Blvd (Ridge Route Dr to El Toro Rd)	62.3	230	107	50
Muirlands Blvd (El Toro Rd to Los Alisos Blvd)	65.2	238	110	51
Portola Pkwy (west of Alton Pkwy)	57.7	151	70	33
Portola Pkwy (Alton Pkwy to Bake Pkwy)	59.1	224	104	48
Portola Pkwy (Bake Pkwy to Lake Forest Dr)	60.6	271	126	58
Portola Pkwy (Lake Forest Dr to Glenn Ranch Rd)	66.6	329	153	71
Portola Pkwy (Glenn Ranch Rd to SR-241)	60.5	279	129	60
Portola Pkwy (SR-241 to Rancho Pkwy)	60.8	294	136	63
Portola Pkwy (Rancho Pkwy to El Toro Rd)	55.3	408	190	88
Rancho Pkwy (west of Bake Pkwy)	59.6	93	43	20
Rancho Pkwy (Bake Pkwy to Lake Forest Dr)	63.9	181	84	39
Rancho Pkwy (Lake Forest Dr to Portola Pkwy)	60.9	222	103	48
Ridge Route Dr (Trabuco Rd to Toledo Way)	58.5	93	43	20
Ridge Route Dr (Toledo Way to Jeronimo Rd)	58.5	93	43	20
Ridge Route Dr (south of Jeronimo Rd)	62.0	102	47	22
Ridge Route Dr (north of Muirlands Blvd)	56.4	93	43	20
Ridge Route Dr (Muirlands Blvd to Rockfield Blvd)	57.9	93	43	20
Ridge Route Dr (south of Rockfield Blvd)	54.2	53	25	11
Rockfield Blvd (west of Lake Forest Dr)	66.2	258	120	56

ROADWAY SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, LDN)[1]	DISTANCES TO TRAFFIC NOISE CONTOURS, LDN (FEET)		
		60 DB	65 DB	70 DB
Rockfield Blvd (Lake Forest Dr to Ridge Route Dr)	69.8	226	105	49
Rockfield Blvd (Ridge Route Dr to El Toro Rd)	63.3	234	109	50
Rockfield Blvd (El Toro Rd to Los Alisos Blvd)	60.8	157	73	34
Santa Margarita Pkwy (east of El Toro Rd)	61.3	423	196	91
Toledo Way (Bake Pkwy to Lake Forest Dr)	56.4	124	57	27
Toledo Way (Lake Forest Dr to Ridge Route Dr)	60.9	124	57	27
Toledo Way (Ridge Route Dr to El Toro Rd)	59.7	103	48	22
Trabuco Rd (Bake Pkwy to Lake Forest Dr)	62.0	292	136	63
Trabuco Rd (Lake Forest Dr to Ridge Route Dr)	63.9	292	136	63
Trabuco Rd (Ridge Route Dr to El Toro Rd)	64.4	318	148	69
Trabuco Rd (east of El Toro Rd)	61.0	252	117	54
Interstate 5	72.2	3326	1544	717
Route 241	62.4	712	330	153

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.
[1] TRAFFIC NOISE LEVELS ARE PREDICTED AT THE CLOSEST SENSITIVE RECEPTORS
SOURCE: KITTELSON & ASSOCIATES, INC., CALTRANS, AND SAXELBY ACOUSTICS

Railroad Noise Levels

To quantify noise exposure from existing train operations, a continuous (24-hour) noise level measurement survey was conducted along the existing Metrolink commuter rail tracks. Based upon the current online schedules, approximately 7 commuter trains travel this line during nighttime (10:00 p.m. – 7:00 a.m.) with 63 daytime (7:00 a.m. – 10:00 p.m.) trains. Noise measurement data also indicated approximately 5 freight trains per day. The purpose of the noise level measurements was to determine typical sound exposure levels (SEL) for railroad line operations, while accounting for the effects of travel speed, warning horns and other factors which may affect noise generation. In addition, the noise measurement equipment was programmed to identify individual train events, so that the typical number of train operations could be determined.

Table 3.12-5 shows a summary of the continuous noise measurement results for railroad activity within the City.

TABLE 3.12-5: RAILROAD NOISE MEASUREMENT RESULTS

MEASUREMENT LOCATION	RAILROAD TRACK	GRADE CROSSING /WARNING HORN	TRAIN EVENTS PER 24-HR PERIOD	AVERAGE SEL AT 75
LT-2	Metrolink	No grade crossing. Occasional horn usage.	75 (54 day, 13 night, 8 evening)	94 dBA

SOURCE: SAXELBY ACOUSTICS - 2018

Noise measurement equipment consisted of Larson Davis Laboratories (LDL) model 831 precision integrating sound level meters equipped with a GRAS ½" microphone. The measurement system was calibrated using a B&K 4230 acoustical calibrator before and after testing. Audio recordings of events were captured along with sound measurement data to help with source identification of events. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

To determine the distances to the CNEL railroad contours, it is necessary to calculate the CNEL for typical train operations. This was done using the SEL values and above-described number and distribution of daily train operations. The Ldn may be calculated as follows:

$$Ldn = SEL + 10 \log N_{eq} - 49.4 \text{ dB, where:}$$

SEL is the mean Sound Exposure Level of the event, N_{eq} is the sum of the number of daytime (7 a.m. to 7 p.m.) events, plus 3.163 times the number of evening (7 p.m. to 10 p.m.) events, plus 10 times the number of nighttime (10 p.m. to 7 a.m.) events per day, and 49.4 is ten times the logarithm of the number of seconds per day. Based upon the above-described noise level data, number of operations and methods of calculation, the CNEL value for railroad line operations have been calculated, and the distances to the CNEL noise level contours are shown in Table 3.12-6.

TABLE 3.12-6: APPROXIMATE DISTANCES TO THE RAILROAD NOISE CONTOURS

EXTERIOR NOISE LEVEL AT 75 FEET, L_{DN}	*DISTANCE TO EXTERIOR NOISE LEVEL CONTOURS, FEET*		
	60 DB L_{DN}	*65 DB L_{DN}*	*70 DB L_{DN}*
METROLINK LINE			
68 dB	264’	123’	57’

SOURCE: SAXELBY ACOUSTICS - 2018.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by federal and state employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

In the City of Lake Forest, fixed noise sources typically include parking lots, loading docks, parks, schools, and other commercial/retail use noise sources (HVAC, exhaust fans, etc.)

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified music and voice

The types of uses which may typically produce the noise sources described above, include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, special events such as concerts, and athletic fields. Typical noise levels associated with various types of stationary noise sources are shown in Table 3.12-7.

TABLE 3.12-7: TYPICAL STATIONARY SOURCE NOISE LEVELS

USE	*NOISE LEVEL AT 100 FEET, LEQ*[1]	*DISTANCE TO NOISE CONTOURS, FEET*			
		50 DB LEQ (NO SHIELDING)	*45 DB LEQ (NO SHIELDING)*	*50 DB LEQ (WITH 5 DB SHIELDING)*	*45 DB LEQ (WITH 5 DB SHIELDING)*
Auto Body Shop	56 dB	200	355	112	200
Auto Repair (Light)	53 dB	141	251	79	141
Busy Parking Lot	54 dB	158	281	89	158
Cabinet Shop	62 dB	398	708	224	398
Car Wash	63 dB	446	792	251	446
Cooling Tower	69 dB	889	1,581	500	889
Loading Dock	66 dB	596	1,059	335	596
Lumber Yard	68 dB	794	1,413	447	794
Maintenance Yard	68 dB	794	1,413	447	794
Outdoor Music Venue	90 dB	10,000	17,783	5,623	10,000

USE	NOISE LEVEL AT 100 FEET, LEQ [1]	DISTANCE TO NOISE CONTOURS, FEET			
		50 DB LEQ (NO SHIELDING)	45 DB LEQ (NO SHIELDING)	50 DB LEQ (WITH 5 DB SHIELDING)	45 DB LEQ (WITH 5 DB SHIELDING)
Paint Booth Exhaust	61 dB	355	631	200	355
Skate Park	60 dB	316	562	178	316
School Playground / Neighborhood Park	54 dB	158	281	89	158
Truck Circulation	48 dB	84	149	47	84
Vendor Deliveries	58 dB	251	446	141	251

NOTE: [1] ANALYSIS ASSUMES A SOURCE-RECEIVER DISTANCE OF APPROXIMATELY 100 FEET, NO SHIELDING, AND FLAT TOPOGRAPHY. ACTUAL NOISE LEVELS WILL VARY DEPENDING ON SITE CONDITIONS AND INTENSITY OF THE USE. THIS INFORMATION IS INTENDED AS A GENERAL RULE ONLY, AND IS NOT SUITABLE FOR FINAL SITE-SPECIFIC NOISE STUDIES.
SOURCE: SAXELBY ACOUSTICS 2018.

COMMUNITY NOISE SURVEY

A community noise survey was conducted to document ambient noise levels at various locations throughout the City. Short-term noise measurements were conducted at six locations throughout the City on April 18 and April 19, 2018 during daytime (7 am – 10 pm) and nighttime (10 pm - 7 am) periods. In addition, four continuous 24-hour noise monitoring sites were also conducted to record day-night statistical noise level trends. The data collected included the hourly average (Leq), median (L50), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 3.12-8 and Table 3.12-9. Figure 3.12-1 shows the locations of the noise monitoring sites.

TABLE 3.12-8: EXISTING CONTINUOUS 24-HOUR AMBIENT NOISE MONITORING RESULTS

SITE	LOCATION	CNEL (DBA)	MEASURED HOURLY NOISE LEVELS, DBA LOW-HIGH (AVERAGE)					
			DAYTIME (7:00 AM - 10:00 PM)			NIGHTTIME (10:00 PM – 7:00 AM)		
			LEQ	L50	LMAX	LEQ	L50	LMAX
1	24621 Bridger Road, 220 feet to I-5 centerline. Partially screened by 16 foot tall sound wall.	72	62-69 (67)	61-68 (67)	71-76 (74)	58-69 (64)	57-69 (62)	64-74 (69)
2	Open space near west end of Shadowfax Drive - 75' to railroad line.	69	57-69 (63)	42-49 (46)	84-101 (89)	35-68 (62)	35-47 (40)	40-92 (78)
3	Skate Park of Etnies Lake Forest, 150' to CL Route 241	62	56-61 (60)	54-61 (58)	69-78 (72)	47-59 (53)	37-56 (45)	66-74 (69)
4	350' South of Portola, 140' to CL of El Toro, on west side of El Toro	61	55-60 (58)	53-58 (55)	70-88 (76)	45-57 (52)	39-55 (46)	61-80 (69)

SOURCE – SAXELBY ACOUSTICS– 2018.

TABLE 3.12-9: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS

SITE	LOCATION	TIME[1]	MEASURED SOUND LEVEL, DB			NOTES
			LEQ	L50	LMAX	
1	Mountain View Park	4:36 p.m.	52	51	59	Park noise. Kids playing. Local traffic. Single engine aircraft overflight, 50-55 dBA.
		11:47 p.m.	44	44	48	Distant traffic. Jet overflight. HNL to ORD. Jets around 45-46 dBA. LAX to Miami.
2	Heroes Park	5:07 p.m.	56	55	65	Ball fields. Traffic. Driving range. Ball "whacks." Single engine aircraft. Two Amtrak passenger trains.
		12:07 a.m.	44	42	52	Traffic. Jet, LAX to ORD. Sprinklers at park.
3	Rancho Serrano Park	3:52 p.m.	47	44	63	Traffic noise from Bake Pkwy. Single engine airplane overflights. High flying jet, LAX to Atlanta.
		11:27 p.m.	42	40	53	Distant traffic. Sprinklers 37 dBA. Jets, 42 dBA. LAX to NYC. LAX to Washington IAD. LAX to Boston. LAX to Toronto.
4	Autumn Glenn & Lake Forest – 120 feet to centerline of Lake Forest	3:31 p.m.	58	56	71	Traffic on Forest Lake dominant. 6' wall at play area. Site of meter not fully shielded.
		11:01 p.m.	52	49	65	Sprinklers 43-47 dBA. Traffic. Jet overflight. LAX to NC
5	Foothill Ranch Community Park	2:01 p.m.	49	47	58	Light breeze. Birds. Helicopter flyover to south. No kids at play equipment. Local traffic. Skater at hockey rink.
		10:41 p.m.	39	37	51	Distant and local traffic.
6	Santiago Canyon Park	2:52 p.m.	47	43	59	Distant and local traffic.
		10:16 p.m.	43	38	60	Distant and local traffic.

1 - ALL COMMUNITY NOISE MEASUREMENT SITES HAVE A TEST DURATION OF 10:00 MINUTES.

SOURCE - SAXELBY ACOUSTICS 2018.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) model 812, 820, and 831 precision integrating sound level meters equipped with ½" microphones. The measurement systems were calibrated using a B&K model 4230 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

The results of the community noise survey shown in Table 3.12-8 and 3.12-9 indicate that existing transportation (traffic) noise sources were the major contributor of noise observed during daytime hours, especially during vehicle pass-bys. Additionally, while frequent jet aircraft overflights from the Los Angeles International Airport (LAX) were audible, with typical noise levels of 42-47 dBA.

3.12.2 REGULATORY SETTING

FEDERAL

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for federally funded roadway projects or projects that require federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

Environmental Protection Agency (EPA)

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an Leq of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an Leq of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA Ldn as the basic goal for residential environments. However, other federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA Ldn, have generally agreed on the 65 dBA Ldn level as being appropriate for residential uses. At 65 dBA Ldn activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The Department of Housing and Urban Development (HUD) was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Housing and Urban Development Act of 1965 (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA Ldn or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA Ldn but not exceeding 75 dBA Ldn - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA Ldn area and 10 dBA of attenuation in a 70 to 75 dBA Ldn area.
- Exceeding 75 dBA Ldn - an unacceptable zone in which projects would not, as a rule, be approved.

HUD’s regulations do not include interior noise standards. Rather a goal of 45 dBA Ldn is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard

construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA Ldn or less, the interior level will be 45 dBA Ldn or less. Thus, structural attenuation is assumed at 20 dBA. However, HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

STATE

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 2011). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

Governor's Office of Planning and Research (OPR)

OPR has developed guidelines for the preparation of general plans (Office of Planning and Research, 2003). The guidelines include land use compatibility guidelines for noise exposure.

LOCAL

Existing City Noise Thresholds

The City of Lake Forest Lake Forest General Plan Safety and Noise Element (June 21, 1994) establishes goals and policies, as well as criteria for evaluating the compatibility of individual land uses with respect to noise exposure. The intent is to provide guidance for determining noise impacts due to, and upon proposed projects. The existing Guiding Principles and Policies of the City's General Plan Noise Element are provided below:

> ***Noise Standards and Land Use Compatibility Guidelines***
>
> *To ensure that noise producers do not adversely affect sensitive receptors, the City will use land use compatibility standards when making planning and development decisions. Table SN-2 summarizes City noise standards for various types of land uses. The standards represent the maximum allowable noise level and will be used to determine noise impacts. The noise standards act as City policy for acceptable noise levels for development.*
>
> *The noise standards are the basis for the development of land use compatibility guidelines, which are presented in a matrix in Table SN-3. The primary purpose of the noise/land use potential conflicts between proposed land uses and the existing and future noise environment. If the noise level of a project falls within Zone A or Zone B, the project is considered compatible with the noise environment. Zone A implies that no mitigation will be*

needed. Zone B implies that minor soundproofing of the structure may be needed to meet the City noise standards. The project proponent will be required to demonstrate that the noise standards will be met prior to project approval.

If the noise level of a project falls within Zone C, substantial noise mitigation will be necessary to meet the noise standards. Mitigation may involve construction of noise barriers and substantial building sound insulation. However, projects in Zone C can be successfully mitigated. The project proponent must demonstrate that the noise standards will be met prior to issuance of a building permit. If the noise levels falls outside of Zones A, B and C, the project is considered clearly incompatible with the noise environment and should not be approved.

TABLE 3.12-10: LAKE FOREST SAFETY AND NOISE ELEMENT TABLE SN-2: INTERIOR AND EXTERIOR NOISE STANDARDS

LAND USE	NOISE STANDARDS (1)	
	INTERIOR (2,3)	EXTERIOR
Residential: Single-Family, Multifamily, Duplex, Mobile Home	CNEL 45 dB	CNEL 65 dB (4)
Residential: Transient Lodging, Hotels, Motels, Nursing Homes, Hospitals	CNEL 45 dB	CNEL 65 dB (4)
Private Offices, Church Sanctuaries, Libraries, Board Rooms, Conference Rooms, Theaters, Auditoriums, Concert Halls, Meeting Halls, etc.	Leq(12) 45 dB(A) (6)2	—
Schools	Leq(12) 45 dB(A)	Leq(12) 67 dB(A) (5)
General Offices, Reception, Clerical, etc.	Leq(12) 50 dB(A)	—
Bank Lobby, Retail Store, Restaurant, Typing Pool, etc.	Leq(12) 55 dB(A)	—
Manufacturing, Kitchen, Warehousing, etc.	Leq(12) 65 dB(A)	—
Park, Playgrounds	—	CNEL 65 dB (5)
Golf Courses, Outdoor Spectator Sports, Amusement Parks	—	CNEL 70 dB (5)

NOTES:

(1) CNEL: COMMUNITY NOISE EQUIVALENT LEVEL.

LEQ(12): THE A-WEIGHTED EQUIVALENT SOUND LEVEL AVERAGED OVER A 12-HOUR PERIOD (USUALLY THE HOURS OF OPERATION).

(2) NOISE STANDARD WITH WINDOWS CLOSED. MECHANICAL VENTILATION SHALL BE PROVIDED PER UBC REQUIREMENTS TO PROVIDE A HABITABLE ENVIRONMENT.

(3) INDOOR ENVIRONMENT EXCLUDING BATHROOMS, TOILETS, CLOSETS AND CORRIDORS.

(4) OUTDOOR ENVIRONMENT LIMITED TO REAR YARD OF SINGLE FAMILY HOMES, MULTIFAMILY PATIOS AND BALCONIES (WITH A DEPTH OF 6' OR MORE) AND COMMON RECREATION AREAS.

(5) OUTDOOR ENVIRONMENT LIMITED TO PLAYGROUND AREAS, PICNIC AREAS, AND OTHER AREAS OF FREQUENT HUMAN USE.

(6) RELIGIOUS INSTITUTIONS (CHURCHES, TEMPLES, AND OTHER PLACES OF WORSHIP) OF A SMALL SIZE (OCCUPANCY) OF 100 PERSONS OR LESS) MAY OCCUPY EXISTING BUILDINGS WITHIN AREAS OF EXTERIOR NOISE LEVELS RANGING FROM 65 TO 75 DB CNEL WITHOUT PROVIDING ADDITIONAL NOISE INSULATION FOR THE BUILDING.

SOURCE: CITY OF LAKE FOREST, JULY 11, 1995.

TABLE 3.12-11: LAKE FOREST SAFETY AND NOISE ELEMENT TABLE SN-3: NOISE/LAND USE COMPATIBILITY MATRIX

LAND USE CATEGORY	*COMMUNITY NOISE EQUIVALENT LEVEL CNEL*						
	55		*60*	*65*	*70*	*75*	*80*
Residential – Single-Family, Multi-family, Duplex	A	A	B	C	C		
Residential – Mobile Homes	A	A	B	C	C		
Transient Lodging – Motels, Hotels	A	A	B	B	C	C	
Schools, Libraries, Churches, Hospitals, Nursing/Convalescent Homes, Preschools, Day Care Centers (1)(2)	A	A	B	C	C		
Auditoriums, Concert Halls, Amphitheaters, Meeting Halls	B	B	C	C			
Sports Areas, Outdoor Spectator Sports, Amusement Parks	A	A	A	B	B		
Playgrounds, Neighborhood Parks	A	A	A	B	C		
Golf Courses, Riding Stables, Cemeteries	A	A	A	A	B	C	C
Office and Professional Buildings	A	A	A	B	B	C	
Commercial Retail, Banks, Restaurants, Theaters	A	A	A	A	B	B	C
Industrial, Manufacturing, Utilities, Wholesale, Service Stations	A	A	A	A	B	B	B
Agriculture	A	A	A	A	A	A	A

NOTES:

ZONE A. NORMALLY ACCEPTABLE—SPECIFIED LAND USE IS SATISFACTORY, BASED ON THE ASSUMPTION THAT ANY BUILDINGS INVOLVED ARE OF NORMAL CONVENTIONAL CONSTRUCTION WITHOUT ANY SPECIAL NOISE INSULATION REQUIREMENTS.

ZONE B. CONDITIONALLY ACCEPTABLE—NEW CONSTRUCTION OR DEVELOPMENT SHOULD BE UNDERTAKEN ONLY AFTER DETAILED ANALYSIS OF NOISE REDUCTION REQUIREMENT IS MADE AND NEEDED NOISE INSULATION FEATURES IN THE DESIGN ARE DETERMINED. CONVENTIONAL CONSTRUCTION, WITH CLOSED WINDOWS AND FRESH AIR SUPPLY SYSTEMS OR AIR-CONDITIONING, WILL NORMALLY SUFFICE.

ZONE C. NORMALLY UNACCEPTABLE—NEW CONSTRUCTION OR DEVELOPMENT SHOULD GENERALLY BE DISCOURAGED. IF NEW CONSTRUCTION OR DEVELOPMENT DOES PROCEED, A DETAILED ANALYSIS OF NOISE REDUCTION REQUIREMENTS MUST BE MADE AND NEEDED NOISE INSULATION FEATURES INCLUDED IN THE DESIGN.

(1) RELIGIOUS INSTITUTIONS (CHURCHES, SYNAGOGUES, TEMPLES AND OTHER PLACES OF WORSHIP) OF A SMALL SIZE (OCCUPANCY OF 100 PERSONS OR LESS) MAY OCCUPY EXISTING BUILDINGS WITHIN AREAS OF EXTERIOR NOISE LEVELS RANGING FROM 65 TO 75 DB CNEL WITHOUT PROVIDING ADDITIONAL NOISE INSULATION FOR THE BUILDING.

(2) SHADED AREAS INDICATE NEW CONSTRUCTION OR DEVELOPMENT SHOULD GENERALLY NOT BE UNDERTAKEN.

SOURCE: CITY OF LAKE FOREST, JULY 11, 1995.

3.12.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the project will have a significant impact related to noise if it will result in:

- Generation of a substantial temporary or permanent increase in the ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive groundbourne vibration or groundbourne noise levels: or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

The City of Lake Forest is not located within any adopted airport land use plan, there are no private airstrips in the vicinity of the City, and there are no public airports located within two miles of the City. As such, there are no impacts related to private airports, public airports, airstrips, or adopted airport land use plans. This environmental topic is not addressed further in this EIR.

IMPACTS AND MITIGATION MEASURES

Generally, a project may have a significant effect on the environment if it will substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been developed. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local project criteria or ordinances, or substantially increase noise levels at noise sensitive land uses. The potential increase in traffic noise from the project is a factor in determining significance. Research into the human perception of changes in sound level indicates the following:

- A 3-dB change is barely perceptible,
- A 5-dB change is clearly perceptible, and
- A 10-dB change is perceived as being twice or half as loud.

A limitation of using a single noise level increase value to evaluate noise impacts is that it fails to account for pre-project-noise conditions. Table 3.12-12 is based upon recommendations made by the Federal Interagency Committee on Noise (FICON) to provide guidance in the assessment of changes in ambient noise levels resulting from aircraft operations. The recommendations are based upon studies that relate aircraft noise levels to the percentage of persons highly annoyed by the noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, it has been accepted that they are applicable to all sources of noise described in terms of cumulative noise exposure metrics such as the Ldn.

TABLE 3.12-12: SIGNIFICANCE OF CHANGES IN NOISE EXPOSURE

AMBIENT NOISE LEVEL WITHOUT PROJECT, LDN	*INCREASE REQUIRED FOR SIGNIFICANT IMPACT*
<60 dB	+5.0 dB or more
60-65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

SOURCE: FEDERAL INTERAGENCY COMMITTEE ON NOISE (FICON)

Based on the Table 3.12-12 data, an increase in the traffic noise level of 1.5 dB or more would be significant where the pre-project noise level exceeds 65 dB Ldn. Extending this concept to higher noise levels, an increase in the traffic noise level of 1.5 dB or more may be significant where the pre-project traffic noise level exceeds 75 dB Ldn. The rationale for the Table 3.12-12 criteria is that, as ambient noise levels increase, a smaller increase in noise resulting from a project is sufficient to cause annoyance.

Vibration Standards

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating.

Vibration can be measured in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities in inches per second. Standards pertaining to perception as well as damage to structures have been developed for vibration levels defined in terms of peak particle velocities.

The City does not have specific policies pertaining to vibration levels. However, vibration levels associated with construction activities and railroad operations are addressed as potential noise impacts associated with project implementation.

Human and structural response to different vibration levels is influenced by several factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Table 3.12-13 indicates that the threshold for damage to structures ranges from 0.2 to 0.6 peak particle velocity in inches per second (in/sec p.p.v).

Construction activities may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams, pile drivers) are used. Construction activities often include demolition of existing structures, excavation, site preparation work, foundation work, and new building framing and finishing.

TABLE 3.12-13: EFFECTS OF VIBRATION ON PEOPLE AND BUILDINGS

PEAK PARTICLE VELOCITY		HUMAN REACTION	EFFECT ON BUILDINGS
MM/SEC.	IN./SEC.		
0.15-0.30	0.006-0.019	Threshold of perception; possibility of intrusion	Vibrations unlikely to cause damage of any type
2.0	0.08	Vibrations readily perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
2.5	0.10	Level at which continuous vibrations begin to annoy people	Virtually no risk of "architectural" damage to normal buildings
5.0	0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relative short periods of vibrations)	Threshold at which there is a risk of "architectural" damage to normal dwelling - houses with plastered walls and ceilings. Special types of finish such as lining of walls, flexible ceiling treatment, etc., would minimize "architectural" damage
10-15	0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic but would cause "architectural" damage and possibly minor structural damage.

SOURCE: CALTRANS. TRANSPORTATION RELATED EARTHBORN VIBRATIONS. TAV-02-01-R9601 FEBRUARY 20, 2002.

For structural damage, the California Department of Transportation uses a vibration limit of 0.5 inches/second, peak particle velocity (in/sec, PPV) for buildings structurally sound and designed to modern engineering standards.

Table 3.12-14 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Construction activities such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet.

TABLE 3.12-14: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

EQUIPMENT		PPV AT 25 FT. (IN/SEC)	APPROXIMATE LV AT 25 FT. (VDB)
Pile Driver (Impact)	upper range	1.158	112
	typical	0.644	104
Pile Driver (Sonic)	upper range	0.734	105
	typical	0.170	93
Clam shovel drop		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87

EQUIPMENT	PPV AT 25 FT. (IN/SEC)	APPROXIMATE LV AT 25 FT. (VDB)
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

SOURCE: TRANSIT NOISE AND VIBRATION IMPACT ASSESSMENT, UNITED STATES DEPARTMENT OF TRANSPORTATION, OFFICE OF PLANNING AND ENVIRONMENT, FEDERAL TRANSIT ADMINISTRATION, MAY 2006.

IMPACTS AND MITIGATION MEASURES

Impact 3.12-1: General Plan implementation may result in substantial noise increase from traffic noise sources (Less than Significant)

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop Ldn (24-hour average) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model predicts hourly Leq values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict Ldn values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the General Plan study area. Day/night traffic distributions were based upon continuous hourly noise measurement data and Saxelby Acoustics file data for similar roadways. Caltrans vehicle truck counts were obtained for SR 5 and SR 241. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Tables 3.12-15 and 3.12-16 show the results of this analysis.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segment. In some locations sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Tables 3.12-15 and 3.12-16 are generally considered to be conservative estimates of noise exposure along roadways in Lake Forest.

Table 3.12-15 shows the future noise levels and the increase in noise levels associated with traffic on the local roadway network under a 20-year circulation system for the proposed General Plan, versus the current General Plan.

Table 3.12-16 shows the future noise levels and the increase in noise levels associated with traffic on the local roadway network under buildout of the circulation system for the proposed General Plan, versus the current General Plan.

TABLE 3.12-15: 2040 CURRENT AND PROPOSED GENERAL PLAN WITH 20-YEAR CIRCULATION SYSTEM

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CURRENT	PROPOSED	CHANGE	CRITERIA[1]	SIGNIFICANT?
Alton Pkwy	Portola Pkwy to SR-241	58.9	61.0	+2.1	+5.0 dB or >65 dB	No
Alton Pkwy	SR-241 to Rancho Pkwy	68.6	69.1	+0.5	+1.5 dB	No
Alton Pkwy	Rancho Pkwy to Commercentre Dr	69.4	69.8	+0.4	+1.5 dB	No
Alton Pkwy	Commercentre Dr to Irvine Blvd	66.4	66.7	+0.3	+1.5 dB	No
Bake Pkwy	Portola Pkwy to Rancho Pkwy	69.5	70.2	+0.7	+1.5 dB	No
Bake Pkwy	Dimension Dr to Commercentre Dr	62.1	62.3	+0.2	+1.5 dB	No
Bake Pkwy	Commercentre Dr to Irvine Blvd/Trabuco Rd	65.9	66.3	+0.4	+1.5 dB	No
Bake Pkwy	Irvine Blvd/Trabuco Rd to Toledo Way	67.6	67.8	+0.2	+1.5 dB	No
Bake Pkwy	Toledo Way to Jeronimo Rd	64.6	64.8	+0.2	+3.0 dB or >65 dB	No
Commercentre Dr	Alton Pkwy to Bake Pkwy	71.3	71.5	+0.2	+1.5 dB	No
Commercentre Dr	East of Bake Pkwy	66.9	68.2	+1.3	+1.5 dB	No
Commercentre Dr	South of Dimension Dr	62.4	63.9	+1.5	+3.0 dB or >65 dB	No
Dimension Dr	Bake Pkwy to Commercentre Dr	62.3	64.2	+1.9	+3.0 dB or >65 dB	No
Dimension Dr	Commercentre Dr to Lake Forest Dr	65.1	66.5	+1.4	+1.5 dB	No
El Toro Rd	North of Glenn Ranch Rd	63.2	63.0	-0.2	+3.0 dB or >65 dB	No
El Toro Rd	Glenn Ranch Rd to Marguerite Pkwy	63.6	63.6	+0.0	+3.0 dB or >65 dB	No
El Toro Rd	Marguerite Pkwy to Portola Pkwy/Santa Margarita Pkwy	63.9	63.9	+0.0	+3.0 dB or >65 dB	No
El Toro Rd	South of Portola Pkwy/Santa Margarita Pkwy	65.2	65.2	+0.0	+1.5 dB	No
El Toro Rd	North of Trabuco Rd	69.2	69.3	+0.1	+1.5 dB	No
El Toro Rd	Trabuco Rd to Toledo Way	66.2	66.3	+0.1	+1.5 dB	No
El Toro Rd	Toledo Way to Jeronimo Rd	72.6	72.8	+0.2	+1.5 dB	No
El Toro Rd	Jeronimo Rd to Muirlands Blvd	70.8	71.2	+0.4	+1.5 dB	No
El Toro Rd	Muirlands Blvd to Rockfield Blvd	64.4	65.0	+0.6	+3.0 dB or >65 dB	No
El Toro Rd	Rockfield Blvd to I-5	68.8	69.6	+0.8	+1.5 dB	No
Glenn Ranch Rd	North of Portola Pkwy	62.3	62.0	-0.3	+3.0 dB or >65 dB	No
Glenn Ranch Rd	West of El Toro Rd	57.2	56.1	-1.1	+5.0 dB or >65 dB	No
Jeronimo Rd	Bake Pkwy to Lake Forest Dr	63.4	64.0	+0.6	+3.0 dB or >65 dB	No
Jeronimo Rd	Lake Forest Dr to Ridge Route Dr	61.2	61.5	+0.3	+3.0 dB or >65 dB	No

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CURRENT	PROPOSED	CHANGE	CRITERIA[1]	SIGNIFICANT?
Jeronimo Rd	Ridge Route Dr to El Toro Rd	62.4	62.7	+0.3	+3.0 dB or >65 dB	No
Jeronimo Rd	El Toro Rd to Los Alisos Blvd	64.4	64.4	+0.0	+3.0 dB or >65 dB	No
Lake Forest Dr	Portola Pkwy to SR-241	67.2	67.4	+0.2	+1.5 dB	No
Lake Forest Dr	SR-241 to Rancho Pkwy	68.6	68.8	+0.2	+1.5 dB	No
Lake Forest Dr	Rancho Pkwy to Dimension Dr	66.5	67.0	+0.5	+1.5 dB	No
Lake Forest Dr	Dimension Dr to Trabuco Rd	66.2	66.5	+0.3	+1.5 dB	No
Lake Forest Dr	Trabuco Rd to Toledo Way	66.0	66.5	+0.5	+1.5 dB	No
Lake Forest Dr	Toledo Way to Jeronimo Rd	66.5	66.8	+0.3	+1.5 dB	No
Lake Forest Dr	Jeronimo Rd to Muirlands Blvd	65.9	66.3	+0.4	+1.5 dB	No
Lake Forest Dr	Muirlands Blvd to Rockfield Blvd	64.0	64.5	+0.5	+3.0 dB or >65 dB	No
Lake Forest Dr	Rockfield Blvd to I-5	68.9	69.7	+0.8	+1.5 dB	No
Los Alisos Blvd	North of Jeronimo Rd	64.3	64.5	+0.2	+3.0 dB or >65 dB	No
Los Alisos Blvd	Jeronimo Rd to Muirlands Blvd	64.2	64.4	+0.2	+3.0 dB or >65 dB	No
Los Alisos Blvd	Muirlands Blvd to Rockfield Blvd	64.4	64.5	+0.1	+3.0 dB or >65 dB	No
Los Alisos Blvd	South of Rockfield Blvd	66.1	66.2	+0.1	+1.5 dB	No
Muirlands Blvd	Bake Pkwy to Lake Forest Dr	62.0	62.0	+0.0	+3.0 dB or >65 dB	No
Muirlands Blvd	Lake Forest Dr to Ridge Route Dr	63.8	64.2	+0.4	+3.0 dB or >65 dB	No
Muirlands Blvd	Ridge Route Dr to El Toro Rd	62.7	63.1	+0.4	+3.0 dB or >65 dB	No
Muirlands Blvd	El Toro Rd to Los Alisos Blvd	65.5	65.7	+0.2	+1.5 dB	No
Portola Pkwy	West of Alton Pkwy	61.4	61.7	+0.3	+3.0 dB or >65 dB	No
Portola Pkwy	Alton Pkwy to Bake Pkwy	59.7	60.1	+0.4	+5.0 dB or >65 dB	No
Portola Pkwy	Bake Pkwy to Lake Forest Dr	61.7	62.1	+0.4	+3.0 dB or >65 dB	No
Portola Pkwy	Lake Forest Dr to Glenn Ranch Rd	67.7	67.7	+0.0	+1.5 dB	No
Portola Pkwy	Glenn Ranch Rd to SR-241	62.6	62.8	+0.2	+3.0 dB or >65 dB	No
Portola Pkwy	SR-241 to Rancho Pkwy	62.1	62.3	+0.2	+3.0 dB or >65 dB	No
Portola Pkwy	Rancho Pkwy to El Toro Rd	56.6	56.8	+0.2	+5.0 dB or >65 dB	No
Rancho Pkwy	West of Bake Pkwy	62.3	62.3	+0.0	+3.0 dB or >65 dB	No

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CURRENT	PROPOSED	CHANGE	CRITERIA[1]	SIGNIFICANT?
Rancho Pkwy	Bake Pkwy to Lake Forest Dr	66.0	66.0	+0.0	+1.5 dB	No
Rancho Pkwy	Lake Forest Dr to Portola Pkwy	62.7	62.9	+0.2	+3.0 dB or >65 dB	No
Ridge Route Dr	Trabuco Rd to Toledo Way	60.4	60.4	+0.0	+3.0 dB or >65 dB	No
Ridge Route Dr	Toledo Way to Jeronimo Rd	60.4	60.4	+0.0	+3.0 dB or >65 dB	No
Ridge Route Dr	South of Jeronimo Rd	63.8	63.8	+0.0	+3.0 dB or >65 dB	No
Ridge Route Dr	North of Muirlands Blvd	58.8	58.8	+0.0	+5.0 dB or >65 dB	No
Ridge Route Dr	Muirlands Blvd to Rockfield Blvd	59.0	59.4	+0.4	+5.0 dB or >65 dB	No
Ridge Route Dr	South of Rockfield Blvd	56.4	56.4	+0.0	+5.0 dB or >65 dB	No
Rockfield Blvd	West of Lake Forest Dr	67.2	67.5	+0.3	+1.5 dB	No
Rockfield Blvd	Lake Forest Dr to Ridge Route Dr	71.1	72.3	+1.2	+1.5 dB	No
Rockfield Blvd	Ridge Route Dr to El Toro Rd	63.6	64.7	+1.1	+3.0 dB or >65 dB	No
Rockfield Blvd	El Toro Rd to Los Alisos Blvd	61.6	62.5	+0.9	+3.0 dB or >65 dB	No
Santa Margarita Pkwy	East of El Toro Rd	62.1	62.2	+0.1	+3.0 dB or >65 dB	No
Toledo Way	Bake Pkwy to Lake Forest Dr	58.1	58.6	+0.5	+5.0 dB or >65dB	No
Toledo Way	Lake Forest Dr to Ridge Route Dr	62.1	62.7	+0.5	+3.0 dB or >65 dB	No
Toledo Way	Ridge Route Dr to El Toro Rd	61.0	61.5	+0.5	+3.0 dB or >65 dB	No
Trabuco Rd	Bake Pkwy to Lake Forest Dr	62.5	62.7	+0.2	+3.0 dB or >65 dB	No
Trabuco Rd	Lake Forest Dr to Ridge Route Dr	64.7	64.9	+0.2	+3.0 dB or >65 dB	No
Trabuco Rd	Ridge Route Dr to El Toro Rd	65.2	65.3	+0.1	+1.5 dB	No
Trabuco Rd	East of El Toro Rd	61.4	61.4	+0.0	+3.0 dB or >65 dB	No

[1] *WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 DB AN INCREASE OF 5 DB WOULD BE A SIGNIFICANT INCREASE. WHERE EXISTING NOISE LEVELS EXCEED 60 DB BUT ARE LESS THAN 65 DB, AN INCREASE OF 3 DB OR MORE WOULD BE SIGNIFICANT. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 65 DB LDN NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 65 DB, AN INCREASE OF 1.5 DB OR MORE WOULD BE SIGNIFICANT.*

SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KIMLEY HORN AND SAXELBY ACOUSTICS. 2019.

TABLE 3.12-16: 2040 CURRENT AND PROPOSED GENERAL PLAN WITH BUILDOUT OF CIRCULATION SYSTEM

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CURRENT	PROPOSED	CHANGE	CRITERIA[1]	SIGNIFICANT ?
Alton Pkwy	Portola Pkwy to SR-241	54.6	58.2	+3.6	+5.0 dB or >65 dB	No
Alton Pkwy	SR-241 to Rancho Pkwy	67.8	68.4	+0.6	+1.5 dB	No
Alton Pkwy	Rancho Pkwy to Commercentre Dr	68.7	69.1	+0.4	+1.5 dB	No
Alton Pkwy	Commercentre Dr to Irvine Blvd	65.6	66.1	+0.5	+1.5 dB	No
Bake Pkwy	Portola Pkwy to Rancho Pkwy	69.4	70.1	+0.7	+1.5 dB	No
Bake Pkwy	Dimension Dr to Commercentre Dr	62.0	62.2	+0.2	+3.0 dB or >65 dB	No
Bake Pkwy	Commercentre Dr to Irvine Blvd/Trabuco Rd	65.8	66.2	+0.4	+1.5 dB	No
Bake Pkwy	Irvine Blvd/Trabuco Rd to Toledo Way	67.5	67.7	+0.2	+1.5 dB	No
Bake Pkwy	Toledo Way to Jeronimo Rd	64.6	64.8	+0.2	+3.0 dB or >65 dB	No
Commercentre Dr	Alton Pkwy to Bake Pkwy	71.3	71.7	+0.4	+1.5 dB	No
Commercentre Dr	East of Bake Pkwy	66.9	68.2	+1.3	+1.5 dB	No
Commercentre Dr	South of Dimension Dr	62.4	63.9	+1.5	+3.0 dB or >65 dB	No
Dimension Dr	Bake Pkwy to Commercentre Dr	62.3	64.2	+1.9	+3.0 dB or >65 dB	No
Dimension Dr	Commercentre Dr to Lake Forest Dr	65.1	66.3	+1.2	+1.5 dB	No
El Toro Rd	North of Glenn Ranch Rd	63.2	63.2	+0.0	+3.0 dB or >65 dB	No
El Toro Rd	Glenn Ranch Rd to Marguerite Pkwy	63.6	63.6	+0.0	+3.0 dB or >65 dB	No
El Toro Rd	Marguerite Pkwy to Portola Pkwy/Santa Margarita Pkwy	63.9	63.9	+0.0	+3.0 dB or >65 dB	No
El Toro Rd	South of Portola Pkwy/Santa Margarita Pkwy	65.2	65.4	+0.2	+1.5 dB	No
El Toro Rd	North of Trabuco Rd	69.2	69.5	+0.3	+1.5 dB	No
El Toro Rd	Trabuco Rd to Toledo Way	66.7	66.8	+0.1	+1.5 dB	No
El Toro Rd	Toledo Way to Jeronimo Rd	72.8	72.9	+0.1	+1.5 dB	No
El Toro Rd	Jeronimo Rd to Muirlands Blvd	71.0	71.4	+0.4	+1.5 dB	No
El Toro Rd	Muirlands Blvd to Rockfield Blvd	64.4	64.9	+0.5	+3.0 dB or >65 dB	No
El Toro Rd	Rockfield Blvd to I-5	68.4	69.2	+0.8	+1.5 dB	No
Glenn Ranch Rd	North of Portola Pkwy	62.5	62.2	-0.3	+3.0 dB or >65 dB	No
Glenn Ranch Rd	West of El Toro Rd	57.2	56.7	-0.5	+5.0 dB or >65 dB	No

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CURRENT	PROPOSED	CHANGE	CRITERIA[1]	SIGNIFICANT ?
Jeronimo Rd	Bake Pkwy to Lake Forest Dr	63.4	63.7	+0.3	+3.0 dB or >65 dB	No
Jeronimo Rd	Lake Forest Dr to Ridge Route Dr	61.2	61.5	+0.3	+3.0 dB or >65 dB	No
Jeronimo Rd	Ridge Route Dr to El Toro Rd	62.4	62.7	+0.3	+3.0 dB or >65 dB	No
Jeronimo Rd	El Toro Rd to Los Alisos Blvd	64.6	64.6	+0.0	+3.0 dB or >65 dB	No
Lake Forest Dr	Portola Pkwy to SR-241	66.7	66.9	+0.2	+1.5 dB	No
Lake Forest Dr	SR-241 to Rancho Pkwy	68.5	68.8	+0.3	+1.5 dB	No
Lake Forest Dr	Rancho Pkwy to Dimension Dr	66.5	67.0	+0.5	+1.5 dB	No
Lake Forest Dr	Dimension Dr to Trabuco Rd	66.2	66.5	+0.3	+1.5 dB	No
Lake Forest Dr	Trabuco Rd to Toledo Way	65.7	66.2	+0.5	+1.5 dB	No
Lake Forest Dr	Toledo Way to Jeronimo Rd	66.2	66.6	+0.4	+1.5 dB	No
Lake Forest Dr	Jeronimo Rd to Muirlands Blvd	65.7	66.1	+0.4	+1.5 dB	No
Lake Forest Dr	Muirlands Blvd to Rockfield Blvd	63.9	64.4	+0.5	+3.0 dB or >65 dB	No
Lake Forest Dr	Rockfield Blvd to I-5	68.5	69.2	+0.7	+1.5 dB	No
Los Alisos Blvd	North of Jeronimo Rd	64.2	64.3	+0.1	+3.0 dB or >65 dB	No
Los Alisos Blvd	Jeronimo Rd to Muirlands Blvd	63.9	64.2	+0.3	+3.0 dB or >65 dB	No
Los Alisos Blvd	Muirlands Blvd to Rockfield Blvd	64.4	64.5	+0.1	+3.0 dB or >65 dB	No
Los Alisos Blvd	South of Rockfield Blvd	66.2	66.6	+0.4	+1.5 dB	No
Muirlands Blvd	Bake Pkwy to Lake Forest Dr	62.0	62.0	+0.0	+3.0 dB or >65 dB	No
Muirlands Blvd	Lake Forest Dr to Ridge Route Dr	63.8	64.2	+0.4	+3.0 dB or >65 dB	No
Muirlands Blvd	Ridge Route Dr to El Toro Rd	62.7	63.1	+0.4	+3.0 dB or >65 dB	No
Muirlands Blvd	El Toro Rd to Los Alisos Blvd	65.5	65.7	+0.2	+1.5 dB	No
Portola Pkwy	West of Alton Pkwy	63.5	64.1	+0.6	+3.0 dB or >65 dB	No
Portola Pkwy	Alton Pkwy to Bake Pkwy	60.7	61.1	+0.4	+3.0 dB or >65 dB	No
Portola Pkwy	Bake Pkwy to Lake Forest Dr	62.4	62.6	+0.2	+3.0 dB or >65 dB	No
Portola Pkwy	Lake Forest Dr to Glenn Ranch Rd	67.9	68.0	+0.1	+1.5 dB	No
Portola Pkwy	Glenn Ranch Rd to SR-241	62.5	62.7	+0.2	+3.0 dB or >65 dB	No

ROADWAY	SEGMENT	NOISE LEVELS (L_{DN}, dB) AT NEAREST SENSITIVE RECEPTORS				
		CURRENT	PROPOSED	CHANGE	CRITERIA[1]	SIGNIFICANT ?
Portola Pkwy	SR-241 to Rancho Pkwy	62.1	62.3	+0.2	+3.0 dB or >65 dB	No
Portola Pkwy	Rancho Pkwy to El Toro Rd	56.6	56.8	+0.2	+5.0 dB or >65 dB	No
Rancho Pkwy	West of Bake Pkwy	62.3	62.3	+0.0	+3.0 dB or >65 dB	No
Rancho Pkwy	Bake Pkwy to Lake Forest Dr	66.0	66.0	+0.0	+1.5 dB	No
Rancho Pkwy	Lake Forest Dr to Portola Pkwy	62.7	62.9	+0.2	+3.0 dB or >65 dB	No
Ridge Route Dr	Trabuco Rd to Toledo Way	60.0	60.0	+0.0	+3.0 dB or >65 dB	No
Ridge Route Dr	Toledo Way to Jeronimo Rd	60.4	60.8	+0.4	+3.0 dB or >65 dB	No
Ridge Route Dr	South of Jeronimo Rd	64.1	64.4	+0.3	+3.0 dB or >65 dB	No
Ridge Route Dr	North of Muirlands Blvd	59.1	59.4	+0.3	+5.0 dB or >65 dB	No
Ridge Route Dr	Muirlands Blvd to Rockfield Blvd	60.2	60.6	+0.4	+3.0 dB or >65 dB	No
Ridge Route Dr	South of Rockfield Blvd	63.4	63.9	+0.5	+3.0 dB or >65 dB	No
Rockfield Blvd	West of Lake Forest Dr	67.2	67.5	+0.3	+1.5 dB	No
Rockfield Blvd	Lake Forest Dr to Ridge Route Dr	71.1	72.0	+0.9	+1.5 dB	No
Rockfield Blvd	Ridge Route Dr to El Toro Rd	63.6	64.7	+1.1	+3.0 dB or >65 dB	No
Rockfield Blvd	El Toro Rd to Los Alisos Blvd	61.6	62.3	+0.7	+3.0 dB or >65 dB	No
Santa Margarita Pkwy	East of El Toro Rd	62.1	62.2	+0.1	+3.0 dB or >65 dB	No
Toledo Way	Bake Pkwy to Lake Forest Dr	58.1	58.1	+0.0	+5.0 dB or >65 dB	No
Toledo Way	Lake Forest Dr to Ridge Route Dr	62.1	62.1	+0.0	+3.0 dB or >65 dB	No
Toledo Way	Ridge Route Dr to El Toro Rd	61.0	61.0	+0.0	+3.0 dB or >65 dB	No
Trabuco Rd	Bake Pkwy to Lake Forest Dr	62.5	62.7	+0.2	+3.0 dB or >65 dB	No
Trabuco Rd	Lake Forest Dr to Ridge Route Dr	64.6	64.9	+0.3	+3.0 dB or >65 dB	No
Trabuco Rd	Ridge Route Dr to El Toro Rd	65.1	65.3	+0.2	+1.5 dB	No
Trabuco Rd	East of El Toro Rd	61.4	61.6	+0.2	+3.0 dB or >65 dB	No

[1] WHERE EXISTING NOISE LEVELS ARE LESS THAN 60 DB AN INCREASE OF 5 DB WOULD BE A SIGNIFICANT INCREASE. WHERE EXISTING NOISE LEVELS EXCEED 60 DB BUT ARE LESS THAN 65 DB, AN INCREASE OF 3 DB OR MORE WOULD BE SIGNIFICANT. ADDITIONALLY, ANY INCREASE CAUSING NOISE LEVELS TO EXCEED THE CITY'S NORMALLY ACCEPTABLE 65 DB LDN NOISE LEVEL STANDARD AT AN EXISTING OUTDOOR ACTIVITY AREA OF A RESIDENTIAL USE WOULD ALSO BE SIGNIFICANT. WHERE EXISTING NOISE LEVELS EXCEED 65 DB, AN INCREASE OF 1.5 DB OR MORE WOULD BE SIGNIFICANT.
SOURCE: FHWA-RD-77-108 WITH INPUTS FROM KITTELSON ASSOCIATES AND SAXELBY ACOUSTICS. 2019.

Buildout of the General Plan would not result to an exceedance of the City's transportation noise standards and/or result in significant increases in traffic noise levels at existing sensitive receptors. As indicated by Table 3.12-15, the related traffic noise level increases with a 20-year circulation system buildout of the proposed General Plan are predicted to increase between 0.1 to 2.1 dB versus the existing General Plan. With buildout of the circulation system under the proposed General Plan traffic noise increases are predicted to be between 0.1 to 3.6 dB versus the existing General Plan, as shown in Table 3.12-16. This is a **less than significant** impact.

Even though no specific mitigation is required in order to reduce future traffic-related noise impacts associated with General Plan buildout, the City has developed the General Plan to include a comprehensive approach to noise, including policies and actions that would minimize future noise increases in the community. General Plan Policies PS-6.1 through PS-6.10, and Actions PS-6a through PS-6d, identified below, are intended to minimize exposure to excessive noise, including noise associated with traffic. Specifically, Policies PS-6.1 and PS-6b support noise-compatible land uses in the vicinity of traffic noise sources and require that new development and infrastructure projects be reviewed for consistency with the noise standards established in proposed General Plan Tables PS-1 and PS-2. The proposed General Plan standards required under Policy PS-6.1 and Action PS-6b, for exposure to traffic noise shown in Table 3.12-15 and Table 3.12-16, meet or exceed the noise level standards of the adopted General Plan shown in Table 3.12-10. Policy PS-6.4 and Actions PS-6b and PS-6c would ensure that new development mitigates potential noise impacts through incorporating the noise control treatments necessary to achieve acceptable noise levels. Action PS-6d sets criteria for evaluating future increases in traffic noise levels. Action PS-6a would ensure that the Municipal Code is updated to be consistent with the noise standards established in the proposed General Plan. Policy PS-6.6 would encourage working with Caltrans to ensure that adequate noise studies are prepared and that noise mitigation measures are considered in State transportation projects. Implementation of the proposed policies and actions of the General Plan will reduce noise and land use compatibility impacts from vehicular traffic noise sources and would ensure that new development is designed to include noise-attenuating features. As shown in Table 3.12-15 and Table 3.12-16, the traffic noise increases associated with the proposed General Plan do not exceed the applicable noise exposure criteria. Therefore, the proposed General Plan would have a **less than significant** impact relative to traffic noise.

GENERAL PLAN POLICIES AND ACTIONS THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

PS-6.1: Land Use Planning. Require development and infrastructure projects to be consistent with the maximum allowable noise exposure standards identified in Table PS-1 to ensure acceptable noise levels for existing and future development.

PS-6.2: Sensitive Facilities. Ensure appropriate mitigation is incorporated into the design of noise-sensitive facilities to minimize noise impacts.

PS-6.3: Site Design. Require site planning and project design techniques to minimize noise impacts adjacent to sensitive uses.

PS-6.4: Noise Control. Ensure that noise levels do not exceed the limits established in Table PS-2 by incorporating sound-reduction design in new construction or revitalization projects impacted by non-transportation-related noise sources.

PS-6.5: Roadway Noise. Encourage nonmotorized transportation alternatives for local trips and the implementation of noise sensitivity measures in the public realm, including traffic-calming road design, lateral separation, natural buffers, and setbacks to decrease excessive motor vehicle noise.

PS-6.6: Highway Noise. Continue to coordinate with the California Department of Transportation (Caltrans) and the Transportation Corridor Agency (TCA) to achieve maximum noise abatement in the design of new highway projects or improvements along I-5.

PS-6.7: Vehicles and Trucks. Monitor and enforce existing speed limits and motor vehicle codes requiring adequate mufflers on all types of vehicles traveling through the city.

PS-6.8: Commercial Noise. Require the use of noise attenuation measures, including screening and buffering techniques, for all new commercial development expected to produce excessive noise; in existing cases where the City's noise standards are exceeded, work with Code Enforcement to require compliance.

PS-6.9: Interjurisdictional Coordination. Coordinate with neighboring cities to minimize noise conflicts between land uses along the City's boundaries.

PS-6.10: Airplane Noise. Maintain communication with John Wayne Airport and other relevant air transportation agencies to ensure that all future plans have limited impacts to the community of Lake Forest.

ACTIONS

PS-6a: Update Chapter 11.16 of the Lake Forest Municipal Code to ensure that the noise standards are consistent with this General Plan, including Tables PS-1 and PS-2, and to require new residential, mixed-use with a residential component, and other noise-sensitive development to be designed to minimize noise exposure to noise sensitive uses through incorporation of site planning and architectural techniques. The update shall also include noise standards for residential uses within a mixed-use development, which may differ from other adopted residential noise standards.

PS-6b: Review new development projects for compliance with the noise requirements established in this General Plan, including the standards established in Tables PS-1 and PS-2. Where necessary, require new development to mitigate excessive noise through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials such as rubberized asphalt.

PS-6c: Require acoustical studies for all new discretionary projects, including those related to development and transportation, which have the potential to generate noise impacts which exceed the standards identified in this General Plan. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with this element.

PS-6d: In making a determination of impact under the California Environmental Quality Act (CEQA), a substantial increase will occur if ambient noise levels have a substantial increase. Generally, a 3 dB increase in noise levels is barely perceptible, and a 5 dB increase in noise levels is clearly perceptible. Therefore, increases in noise levels shall be considered to be substantial when the following occurs:

- *When existing noise levels are less than 60 dB, a 5 dB increase in noise will be considered substantial;*
- *When existing noise levels are between 60 dB and 65 dB, a 3 dB increase in noise will be considered substantial;*
- *When existing noise levels exceed 65 dB, a 1.5 dB increase in noise will be considered substantial.*

Impact 3.12-2: General Plan implementation may result in exposure to excessive railroad noise sources (Less than Significant)

Table 3.12-6 indicates that the 60 dB Ldn railroad noise contours for the Metrolink commuter/freight line may extend up to 264 feet from the railroad centerline, respectively. Future development located along these railroad lines could therefore be exposed to unacceptable exterior noise levels. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

Policies PS-6.1 through PS-6.4, and Actions PS-6a through PS-6c, identified below, are intended to minimize exposure to excessive noise, including noise associated with railroad operations. Specifically, Policy PS-6.1 and Action PS-6a support noise-compatible land uses in the vicinity of traffic noise sources and require that new development and infrastructure projects be reviewed for consistency with the noise standards established in Tables PS-1 and PS-2. Policy PS-6.4 and Actions PS-6b and PS-6c would ensure that new development mitigates potential noise impacts through incorporating the noise control treatments necessary to achieve acceptable noise levels.

Implementation of these General Plan policies and actions would ensure that development allowed under the proposed General Plan is not exposed to noise levels associated with railroad operations in excess of the City's established standards. This is a **less than significant** impact.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-6.1: Land Use Planning. Require development and infrastructure projects to be consistent with the maximum allowable noise exposure standards identified in Table PS-1 to ensure acceptable noise levels for existing and future development.

PS-6.2: Sensitive Facilities. Ensure appropriate mitigation is incorporated into the design of noise-sensitive facilities to minimize noise impacts.

PS-6.3: Site Design. Require site planning and project design techniques to minimize noise impacts adjacent to sensitive uses.

PS-6.4: Noise Control. Ensure that noise levels do not exceed the limits established in Table PS-2 by incorporating sound-reduction design in new construction or revitalization projects impacted by non-transportation-related noise sources.

ACTIONS

PS-6a: Update Chapter 11.16 of the Lake Forest Municipal Code to ensure that the noise standards are consistent with this General Plan, including Tables PS-1 and PS-2, and to require new residential, mixed-use with a residential component, and other noise-sensitive development to be designed to minimize noise exposure to noise sensitive uses through incorporation of site planning and architectural techniques. The update shall also include noise standards for residential uses within a mixed-use development, which may differ from other adopted residential noise standards.

PS-6b: Review new development projects for compliance with the noise requirements established in this General Plan, including the standards established in Tables PS-1 and PS-2. Where necessary, require new development to mitigate excessive noise through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials such as rubberized asphalt.

PS-6c: Require acoustical studies for all new discretionary projects, including those related to development and transportation, which have the potential to generate noise impacts which exceed the standards identified in this General Plan. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with this element.

Impact 3.12-3: Implementation of the General Plan could result in the generation of excessive stationary noise sources (Less than Significant)

Implementation of the General Plan could result in the future development of land uses that generate noise levels in excess of applicable City noise standards for non-transportation noise sources. Such land uses may include commercial area loading docks, industrial uses, HVAC equipment, car washes, daycare facilities, auto repair, and recreational uses. While the General Plan does not specifically propose any new noise generating uses, the Land Use Map includes industrial land use designations, which may result in new noise sources. Specific land uses that would be located in the City are not known at this time. Additionally, noise from existing stationary sources, as identified in the background section of this chapter, will continue to impact noise-sensitive land uses in the vicinity. New projects which may include stationary noise sources such as automotive and truck repair facilities, tire installation centers, car washes, loading docks, corporation yards, parks, and play fields may create noise levels in excess of the City's standards. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

The General Plan includes policies and actions that are intended to reduce noise associated with stationary sources (listed below). Specifically, Policies PS-6.1, PS-6.2, PS-6.3, PS-6.4, and PS-6.8 and Actions PS-6a, PS-6b, and PS-6c would reduce noise associated with stationary sources. Implementation

of the proposed policies and actions of the General Plan will reduce noise impacts from stationary noise sources to a **less than significant** level.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PS-6.1: Land Use Planning. Require development and infrastructure projects to be consistent with the maximum allowable noise exposure standards identified in Table PS-1 to ensure acceptable noise levels for existing and future development.

PS-6.2: Sensitive Facilities. Ensure appropriate mitigation is incorporated into the design of noise-sensitive facilities to minimize noise impacts.

PS-6.3: Site Design. Require site planning and project design techniques to minimize noise impacts adjacent to sensitive uses.

PS-6.4: Noise Control. Ensure that noise levels do not exceed the limits established in Table PS-2 by incorporating sound-reduction design in new construction or revitalization projects impacted by non-transportation-related noise sources.

PS-6.8: Commercial Noise. Require the use of noise attenuation measures, including screening and buffering techniques, for all new commercial development expected to produce excessive noise; in existing cases where the City's noise standards are exceeded, work with Code Enforcement to require compliance.

ACTIONS

PS-6a: Update Chapter 11.16 of the Lake Forest Municipal Code to ensure that the noise standards are consistent with this General Plan, including Tables PS-1 and PS-2, and to require new residential, mixed-use with a residential component, and other noise-sensitive development to be designed to minimize noise exposure to noise sensitive uses through incorporation of site planning and architectural techniques. The update shall also include noise standards for residential uses within a mixed-use development, which may differ from other adopted residential noise standards.

PS-6b: Review new development projects for compliance with the noise requirements established in this General Plan, including the standards established in Tables PS-1 and PS-2. Where necessary, require new development to mitigate excessive noise through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials such as rubberized asphalt.

PS-6c: Require acoustical studies for all new discretionary projects, including those related to development and transportation, which have the potential to generate noise impacts which exceed the standards identified in this General Plan. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with this element.

Impact 3.12-4: General Plan implementation may result in an increase in construction noise sources (Less than Significant)

New development, maintenance of roadways, and installation of public utilities and infrastructure generally require construction activities. These activities include the use of heavy equipment and impact tools. Table 3.12-16 provides a list of the types of equipment which may be associated with construction activities, and their associated noise levels.

TABLE 3.12-16: CONSTRUCTION EQUIPMENT NOISE

TYPE OF EQUIPMENT	PREDICTED NOISE LEVELS, LMAX DB				DISTANCES TO NOISE CONTOURS (FEET)	
	NOISE LEVEL AT 50'	NOISE LEVEL AT 100'	NOISE LEVEL AT 200'	NOISE LEVEL AT 400'	70 DB LMAX CONTOUR	65 DB LMAX CONTOUR
Backhoe	78	72	66	60	126	223
Compactor	83	77	71	65	223	397
Compressor (air)	78	72	66	60	126	223
Concrete Saw	90	84	78	72	500	889
Dozer	82	76	70	64	199	354
Dump Truck	76	70	64	58	100	177
Excavator	81	75	69	63	177	315
Generator	81	75	69	63	177	315
Jackhammer	89	83	77	71	446	792
Pneumatic Tools	85	79	73	67	281	500

SOURCE: ROADWAY CONSTRUCTION NOISE MODEL USER'S GUIDE. FEDERAL HIGHWAY ADMINISTRATION. FHWA-HEP-05-054. JANUARY 2006. SAXELBY ACOUSTICS, LLC 2019.

Activities involved in construction would typically generate maximum noise levels ranging from 85 to 90 dB at a distance of 50 feet. Construction could result in periods of significant ambient noise level increases and the potential for annoyance. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

The proposed General Plan includes policies and actions that are intended to reduce noise associated with construction noise (listed below). Specifically, Action PS-6e would reduce noise associated with construction noise. Implementation of the proposed policies and actions of the General Plan will reduce noise impacts from construction noise to a **less than significant** level.

GENERAL PLAN ACTION THAT MITIGATES POTENTIAL IMPACTS

PS-6e: Update the City's Noise Ordinance (Chapter 11.16) to reflect the noise standards established in this General Plan and proactively enforce the City's Noise Ordinance, including requiring the following measures for construction:

- *Restrict construction activities to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday, and 8:00 a.m. to 6:00 p.m. on Saturdays. No construction shall be permitted outside of these hours or on Sundays or federal holidays, without a specific exemption issued by the City.*
- *A Construction Noise Management Plan shall be submitted by the applicant for construction projects, when determined necessary by the City. The Construction Noise Management Plan*

shall include proper posting of construction schedules, appointment of a noise disturbance coordinator, and methods for assisting in noise reduction measures.

- *Noise reduction measures may include, but are not limited to, the following:*
    - *Equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) wherever feasible.*
    - *Except as provided herein, impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. This muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used, if such jackets are commercially available. this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.*
    - *Temporary power poles shall be used instead of generators where feasible.*
    - *Stationary noise sources shall be located as far from adjacent properties as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the City of provide equivalent noise reduction.*
    - *The noisiest phases of construction shall be limited to less than 10 days at a time. Exceptions may be allowed if the City determines an extension is necessary and all available noise reduction controls are implemented.*
    - *Delivery of materials shall observe the hours of operation described above. Truck traffic should avoid residential areas to the extent possible.*
- *Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to the building. A vibration limit of 0.30 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.*

Impact 3.12-5: General Plan implementation may result in construction vibration (Less than Significant)

Construction activities facilitated by the proposed General Plan may include demolition of existing structures, site preparation work, excavation of below grade levels, foundation work, pile driving, and new building erection. Demolition for an individual site may last several weeks and at times may produce substantial vibration. Excavation for underground levels may also occur on some project sites and vibratory pile driving could be used to stabilize the walls of the excavated area. Piles or drilled caissons may also be used to support building foundations.

Heavy tracked vehicles (e.g., bulldozers or excavators) can generate distinctly perceptible groundborne vibration levels when this equipment operates within approximately 25 feet of sensitive land uses. Impact pile drivers can generate distinctly perceptible groundborne vibration levels at distances up to about 100 feet, and may exceed building damage thresholds within 25 feet of any building, and within 50-100 feet of a historical building, or building in poor condition. Other construction activities, such as caisson drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may also potentially generate substantial vibration in the immediate vicinity.

Depending on the proximity of existing structures to each construction site, the structural soundness of the existing buildings, and the methods of construction used, vibration levels may be high enough to damage existing structures. Given the scope of the General Plan and the close proximity of many existing structures, groundborne vibration impacts would be potentially significant.

As with any type of construction, vibration levels may at times be perceptible. However, construction phases that have the highest potential of producing vibration (pile driving and use of jackhammers and other high power tools) would be intermittent and would only occur for short periods of time for any individual project site. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

General Plan Action PS-6e would ensure administrative controls such as notifying neighbors of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration to hours with the least potential to affect nearby businesses, in order to ensure that perceptible vibration can be kept to a minimum, and as such would not result in a significant impact with respect to perception. Therefore, the potential for significant impacts associated with construction vibration is **less than significant**.

GENERAL PLAN ACTION THAT MITIGATES POTENTIAL IMPACTS

PS-6e: Update the City's Noise Ordinance (Chapter 11.16) to reflect the noise standards established in this General Plan and proactively enforce the City's Noise Ordinance, including requiring the following measures for construction:

- *Restrict construction activities to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday, and 8:00 a.m. to 6:00 p.m. on Saturdays. No construction shall be permitted outside of these hours or on Sundays or federal holidays, without a specific exemption issued by the City.*
- *A Construction Noise Management Plan shall be submitted by the applicant for construction projects, when determined necessary by the City. The Construction Noise Management Plan shall include proper posting of construction schedules, appointment of a noise disturbance coordinator, and methods for assisting in noise reduction measures.*
- *Noise reduction measures may include, but are not limited to, the following:*
    - *Equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers,*

ducts, engine enclosures and acoustically attenuating shields or shrouds) wherever feasible.

- *Except as provided herein, impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. This muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used, if such jackets are commercially available. this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.*
- *Temporary power poles shall be used instead of generators where feasible.*
- *Stationary noise sources shall be located as far from adjacent properties as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the City of provide equivalent noise reduction.*
- *The noisiest phases of construction shall be limited to less than 10 days at a time. Exceptions may be allowed if the City determines an extension is necessary and all available noise reduction controls are implemented.*
- *Delivery of materials shall observe the hours of operation described above. Truck traffic should avoid residential areas to the extent possible.*

- *Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to the building. A vibration limit of 0.30 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.*

Impact 3.12-6: General Plan implementation may result in exposure to groundborne vibration (Less than Significant)

Development facilitated by the General Plan could expose persons to excessive groundborne vibration levels attributable to trains. The proposed locations of buildings and their specific sensitivity to vibration are not known at this time; however, such uses located in close proximity to railroad tracks could be exposed to ground vibration levels exceeding FTA guidelines. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

The proposed General Plan includes Action PS-6f requires that individual development projects undergo project-specific environmental review and address potential vibration impacts associated with railroad operations. If project-level significant vibration impacts are identified, specific mitigation measures will be required under CEQA. The implementation of this policy would limit potential groundborne vibrations associated with railroad operations to a **less than significant** level.

GENERAL PLAN ACTION THAT MITIGATES POTENTIAL IMPACTS

PS-6f: The City shall require new residential projects located adjacent to major freeways, hard rail lines, or light rail lines to follow the FTA vibration screening distance criteria to ensure that residential uses are not exposed to vibrations exceeding 72 VdB for frequent events (more than 70 events per day), 75 VdB for occasional events (30-70 events per day), or 80 VdB for infrequent events (less than 30 events per day).

Impact 3.12-7: General Plan implementation may result in cumulative noise impacts (Less than cumulatively considerable)

Tables 3.12-15 and 3.12-16 show the existing and cumulative noise levels associated with traffic on the local roadway network, including projects within the Planning Area. Cumulative conditions include traffic due to buildout of the General Plan in addition to pass-through traffic from other jurisdictions. The tables also show the estimated noise level increases which may occur under cumulative conditions.

As shown in the above-referenced tables, cumulative conditions would not contribute to an exceedance of the City's transportation noise standards and would not result in significant increases in traffic noise levels at existing sensitive receptors.

General Plan Policies PS-6.1 through PS-6.10, and Actions PS-6a through PS-6d, are intended to minimize exposure to excessive noise, including noise associated with traffic. Specifically, Policies PS-6.1 and PS-6b support noise-compatible land uses in the vicinity of traffic noise sources and require that new development and infrastructure projects be reviewed for consistency with the noise standards established in Tables PS-1 and PS-2. The proposed General Plan standards required under Policy PS-6.1 and PS-6b, for exposure to traffic noise shown in Table 3.12-15 and Table 3.12-16, do not exceed the noise level standards of the adopted General Plan shown in Table 3.12-10. Policy PS-6.4 and Actions PS-6b and PS-6c would ensure that new development mitigates potential noise impacts through incorporating the noise control treatments necessary to achieve acceptable noise levels. Action PS-6d sets criteria for evaluating future increases in traffic noise levels. Action PS-6a would ensure that the Municipal Code, including the updated noise ordinance, is consistent with the noise standards established in the General Plan. Policy PS-6.6 would encourage working with Caltrans to ensure that adequate noise studies are prepared and that noise mitigation measures are considered in State transportation projects. As described in Impact 3.12-1, implementation of the proposed policies and actions of the General Plan will reduce noise and land use compatibility impacts from vehicular traffic noise sources and would ensure that new development is designed to include noise-attenuating features. As shown in Table 3.12-15 and Table 3.12-16, the traffic noise increases associated with the proposed General Plan do not exceed the applicable noise exposure criteria. Therefore, the proposed General Plan would have a **less than cumulatively considerable** impact relative to traffic noise.

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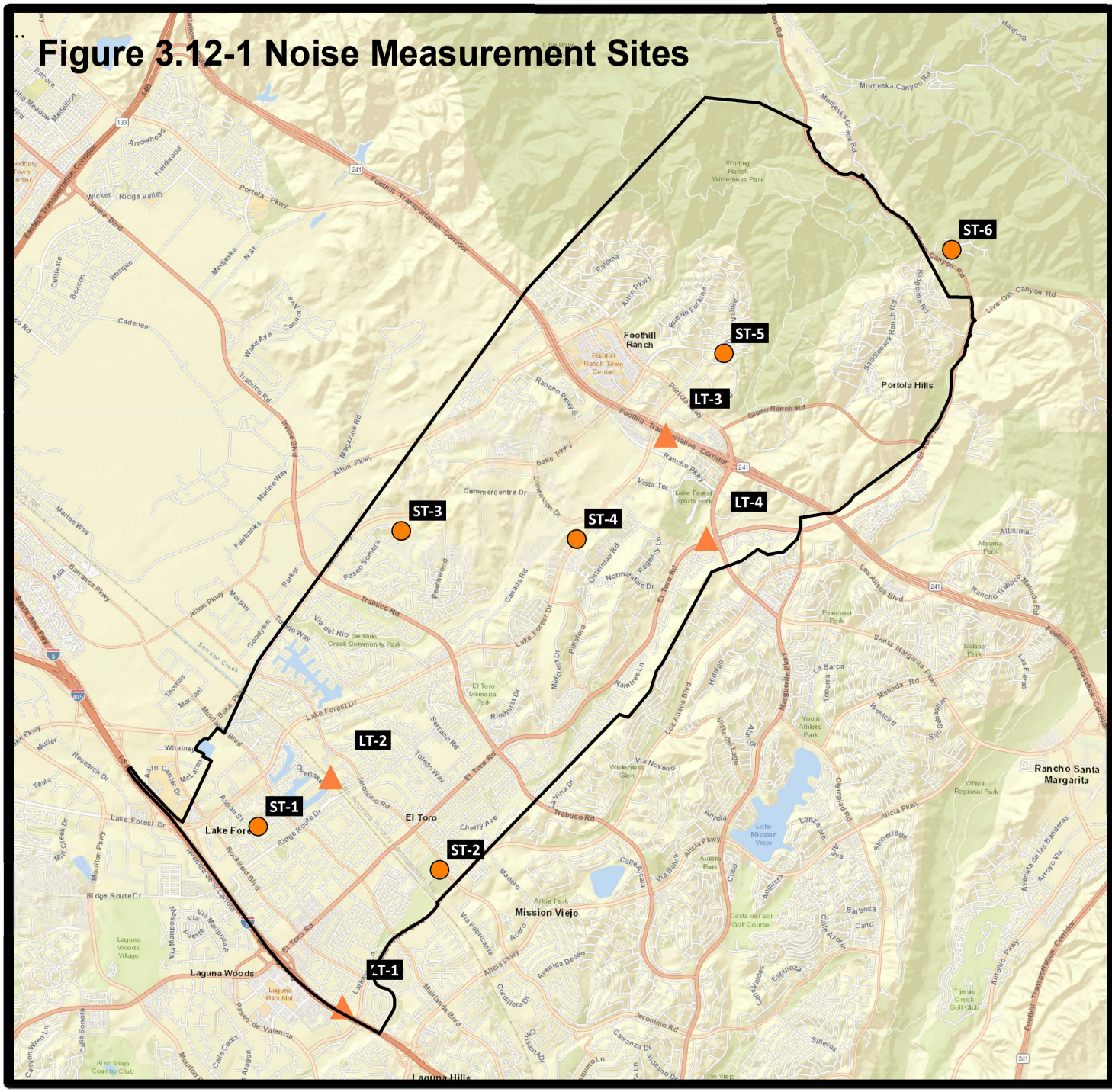
Figure 3.12-1 Noise Measurement Sites



Lake Forest General Plan Update

City of Lake Forest, California

Legend

- Lake Forest City Boundary
- Noise Measurement - Long Term
- Noise Measurement - Short Term

0 ft 3000 ft 6000 ft 9000 ft

Projection: State Plane (California Zone 6) / NAD83 / feet
Rev. Date: 05/31/2018

SAXELBY ACOUSTICS
Acoustics · Noise · Vibration

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Public services such as fire and police protection are vital to maintaining a safe and healthy community. Educational services serve as a foundation for providing citizens with the skills and resources to excel today and in the future. There are many other public services that are important to a community, such as parks and recreational opportunities, libraries, museums, hospitals, and other healthcare facilities.

This section provides a background discussion and analysis of fire protection services, police services, schools, parks and recreational facilities, libraries, and other community facilities and services. This section is organized with an existing setting, regulatory setting, and impact analysis.

Utilities services, including water, sewer, and solid waste disposal are addressed in Chapter 3.15 (Utilities and Service Systems) of this Draft EIR.

No comments were received during the NOP comment period regarding this environmental topic.

3.13.1 EXISTING CONDITIONS

FIRE PROTECTION SERVICES

The Orange County Fire Authority (OCFA) is a regional fire service agency that serves the City of Lake Forest as well as a total of 23 cities and all unincorporated areas in Orange County. The OCFA protects over 1,790,000 residents from its 72 fire stations located throughout Orange County. OCFA Reserve Firefighters work 10 stations throughout Orange County.

The mission of the OCFA is to "enhance public safety and meet the evolving needs of our communities through education, prevention, and emergency response."

Prior to the 1980s, fire services for many of the cities of Orange County and unincorporated areas were provided by the California Department of Forestry. However, in 1980 the Orange County Fire Department (OCFD) was formed to take over firefighting responsibilities for the area. Since that time the organization has continued to grow and develop. In 1995 the Orange County Fire Authority (OCFA) was formed, at which time the City of Lake Forest joined the OCFA's service area.

The OCFA now serves Orange County's 1.8 million residents, protecting 23 cities and unincorporated areas of Orange County which amounts to 571 square miles, including 175,000 acres of wildland. The OCFA has a 97.3% service approval rating for its work in educating, preventing, and responding to emergency situations. Lake Forest is currently served by Division 5, Battalion 4 of the OCFA.

In 2017, the OCFA responded to a total of 5,514 incidents. Of these calls, the vast majority were associated with provision of emergency medical services, as shown in Table 3.13-1.

TABLE 3.13-1 FIRE DEPARTMENT INCIDENT TYPE REPORT BY TYPE

CATEGORY	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Population	**78,391**	**78,877**	**79,278**	**79,852**	**82,147**	**83,240**	**84,931**
Square Miles	16.79	16.79	16.79	16.79	16.79	16.79	16.79
Fire Stations	3	3	3	3	3	3	3
Unit Responses	6,900	7,464	7,580	7,183	7,763	6,837	7,150
Fire Incidents	92	76	69	78	80	98	90
EMS Incidents	3,063	3,272	3,297	3,384	3,792	4,013	4,325
Other Incidents	1,014	1,028	1,074	936	1,002	1,083	1,099
Difference from Previous Year	N/A	5%	1%	-1%	11%	7%	6%
Total	**4,169**	**4,379**	**4,440**	**4,398**	**4,874**	**5,194**	**5,514**

SOURCE: ORANGE COUNTY FIRE ASSOCIATION, ANNUAL REPORT, HTTP://WWW.OCFA.ORG/TRANSPARENCY/TRANSPARENCY.ASPX#GOVERNANCE (2011, 2012, 2013, 2014, 2015, 2016, 2017).
** POPULATION DATA FROM CENSUS*

Fire Stations

The Orange County Fire Department (OCFD) operates three fire stations within the City of Lake Forest, as shown on Figure 3.13-1.

- Fire Station 19 is located at 23022 El Toro Road.
- Fire Station 42, located at 19159 Ridgeline Road.
- Fire Station 54 is located at 19811 Pauling Avenue.

Fire Department Programs

The Orange County Fire Authority provides more than fire and emergency medical services. It operates a number of programs that include information on cooking fires, disaster preparedness, drowning prevention, fire safety, smoke alarm and home escape plans, the Ready, Set, Go! Wildfire Emergency Preparedness Action Plan, the Fire FRIENDS program, and information regarding current wildfire danger. In 2017, the OCFA participated in a total of 107 community outreach and educational events as part of its mission to enhance the public safety through education.

Fire FRIENDS

Fire FRIENDS is a collaboration of community-based partners joining together with the common goal of reducing the number of deaths, burn injuries and property destruction caused by juvenile firesetting. The OCFA provides fire safety education and intervention to children with an interest in fire or explosives, and to those who have been involved in a firesetting incident. In situations where the behaviors or concerns appear to be more serious, the Fire FRIENDS program offers a referral for a free confidential behavioral health evaluation with an experienced behavioral health professional.

Ready, Set, Go! Wildfire Emergency Preparedness

The "Ready, Set, Go!" Action Plan, available to all City of Lake Forest residents on the Fire Department's website, is an easy to understand guide for how to make your home resistant to wildfires as well as preparing your family to leave early and safely. This process is called "Ready, Set, Go!" (RSG). The publication was prepared by the International Association of Fire Chief's RSG! Program and the U.S.D.A Forest Service, U.S. Department of the Interior, and the U.S. Fire Administration, in collaboration with the Lake Forest Fire Department.

The Action Plan describes the risks and responsibilities associated with living in a Wildland Urban Interface and Ember Zone, which is generally the area where residential development meets natural open space. Residents in these areas and on the wildland boundary should assist firefighters by providing "defensible space" around their home, effectively creating a buffer zone by removing weeds, brush, and other vegetation. The Action Plan also provides direction on how to make your home more fire resistant by selecting certain materials and design features that protect the home against fire and assist firefighters with defending the structure. Information is included to help people prepare their own Action Guide, including a checklist for getting ready, a checklist to ensure you're prepared to leave, and a checklist of how you should respond when it's time to leave.

POLICE PROTECTION SERVICES

The City of Lake Forest contracts with the Orange County Sheriff's Department for law enforcement. Lake Forest enjoys relatively low crime rate and was recognized in 2010 by a national firm as the 7th safest City in the United States (of cities with populations between 75,000 and 100,000).

The mission of the Orange County Sheriff's Department states: "The men and women of the Orange County Sheriff's Department are dedicated to the protection of all we serve. We provide exceptional law enforcement services free from prejudice or favor, with leadership, integrity, and respect."

The Orange County Sheriff's Department Staff include: five Sergeants, three Investigators, 38 Deputies, an Investigative Assistant, five Community Services Officers, and a Crime Prevention Specialist.

Services provided through the City include direct and preventative patrol, a Special Enforcement Team, Traffic Enforcement (motorcycle and commercial), a Homeless Liaison Officer, a deputy assigned to the regional Directed Enforcement Team, School Resource Officers, Bike Patrol, Neighborhood and Business Watch programs, as well as emergency preparedness classes for the community. In addition to these services, the sheriff's department also provides street and regional narcotics suppression programs, a Gang Enforcement Team, Mounted Unit, Special Weapons and Tactics Team (SWAT), Hostage Negotiations, the Drug Use is Life Abuse drug

prevention program, and a complement of patrol-trained Reserve Deputy Sheriffs, many of whom volunteer their time for City events such as the Annual 4th of July Parade.

In addition to being responsible for the protection of citizens, the enforcement of laws, and crime prevention, the Orange County Sheriff's Department runs a number of programs including:

- The Orange County Sheriff's Department Citizen's Academy
- Stay Safe OC

THE CITIZEN'S ACADEMY

The Citizens' Academy is a 9-week informational series designed to give citizens a view into the daily operations of the Orange County Sheriff's Department. It is an interactive course that includes instruction and field trips.

STAY SAFE OC

Stay Safe OC is a partnership between the OC Sheriff's Department and the various communities it serves. It involves educational programs and resources that focus on reducing and preventing crime.

Other community policing and educational programs or services offered by the City of Lake Forest include:

- Alert OC
- Don't Make It Easy
- Homeless Program
- Neighborhood Watch
- Business Watch
- Crime Information
- Fingerprinting
- Shredding Program
- Vacation Home Checks

NEARBY JAIL FACILITIES

The James A. Musick Facility is a one-hundred-acre minimum security facility known as "The Farm." The facility is located in an unincorporated area of the county near the cities of Irvine and Lake Forest. The inmates housed at the facility are considered to be a low security risk and most are in jail for crimes such as driving under the influence, minor drug possession, burglary, failure to pay child support, and or prostitution. Inmates and ICE detainees who have committed violent crimes, sex crimes or mayhem are not eligible for transfer to the facility.

The James A. Musick Facility provides custodial and rehabilitative programs for 1,322 adult male and female inmates and ICE detainees. Educational programs are available which enable the

inmates to receive a G.E.D. while incarcerated. In addition, educational classes are offered in subjects such as; parenting, substance abuse, HiSET, and English as a Second Language (ESL). Vocational Classes that are offered at the facility includes; Cabinetry, Welding, and Workforce Readiness. The laundry facility at Musick also serves the Theo Lacy facility as well as Orange County Juvenile Hall in addition to the laundry needs for the Musick facility.

Crimes by Category in Lake Forest

Statistics on the number of crimes by category of crime in Lake Forest during each year from 2010 to 2015, as reported by the Federal Bureau of Investigation (FBI) Criminal Justice Information Services Division, are shown in Table 3.13-2 below.

TABLE 3.13-2 CRIMES BY CATEGORY

CATEGORY	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*
Population	75,780	78,172	79,166	79,336	79,748	80,798	83,511
Violent Crime	92	89	107	105	104	109	105
Homicide	0	2	0	2	0	0	0
Rape	8	1	8	12	19	15	17
Robbery	32	22	20	23	18	23	13
Aggravated Assault	52	64	79	68	67	71	75
Violent Crime Rate Per 100,000 Population	*121.4*	*113.9*	*135.2*	*132.3*	*130.1*	*134.9*	*125.7*
Property Crimes	959	947	1,088	813	682	908	746
Burglary	161	140	227	150	127	134	135
Larceny-Theft	736	763	798	620	493	684	533
Vehicle Theft	62	44	63	43	62	90	78
Arson	5	8	4	1	2	2	7
Property Crime Rate Per 100,000 Population	*1,265.5*	*1,211.4*	*1,374.3*	*1,024.8*	*855.2*	*1,123.8*	*893.3*

SOURCE: FEDERAL BUREAU OF INVESTIGATION, CRIMINAL JUSTICE INFORMATION SERVICES DIVISION, OFFENSES KNOWN TO LAW ENFORCEMENT TABLES (2010, 2011, 2012, 2013, 2014, 2015, AND 2016).

As shown in the table, the majority of crimes committed in Lake Forest consist of non-violent property crimes, primarily larceny- theft.

PARKS AND RECREATIONAL FACILITIES

Types of Parks

The City of Lake Forest's Community Services Department provides planning and coordination for City-wide events, recreation activities for youth, teen, adults, and seniors, and programming for

the Sports Park and Skatepark. The City's Public Works Maintenance Division maintains the City's lakes, creeks, forests, and open space, and oversees a maintenance contract with an outside entity for all park maintenance. The City maintains 30 parks with the development of additional parks planned in the future. The City is currently updating 10 smaller City parks.

The National Recreation and Parks Association (NRPA) has created a set of standards for classification of park and recreation facilities to help serve as a guide to planning. This classification system is to be used as a boilerplate set of standards to be modified to fit the individual municipality's needs. According to the NRPA classification system, parks are usually categorized according to their service area, size, function, and acres/1,000 population. The Recreation and Resources Element of the General Plan was updated by the City of Lake Forest in 2015. Below are descriptions of the three categories of parks as defined by the NRPA, as well as the standards created by the City of Lake Forest:

Mini parks: These parks serve the recreational needs of neighborhoods and planned communities, and serve as public focus areas for neighborhoods, in close proximity to the intended users and often serve as a substitute for backyards. The City requires features such as active sports courts/fields, tot lots, picnic/BBQ areas.

The City standards for these parks are as follows:

- Desirable Size: 0.5 to 1.0 acre
- Service Area: < 0.25-mile radius
- Acres/Population: 0.25 to 0.5 acres/1,000 pop.

Neighborhood parks: Neighborhood parks are designed for intense recreational activities such as: field games, court games, crafts, playground areas, picnicking, etc. These parks should be easily accessible to the neighboring population and geographically centered with safe bicycling or walking access.

The City standards for these parks are as follows:

- Desirable Size: 1.0 to 10.0 acres
- Service Area: 0.25- to 0.5-mile radius
- Acres/Population: 1.0 to 2.0 acres/1,000 pop.

Community parks: This category of park generally offers a wide range of recreational amenities and facilities including: athletic complexes, swimming pools, arenas, sheltered picnic areas, playground facilities, and/or areas of natural quality for outdoor recreation. Amenities in community parks may vary depending on the park setting and the needs of the surrounding community.

The City standards for these parks are as follows:

- Desirable Size: 10.0 to 25.0 acres
- Service Area: 1.0- to 2.0-mile radius

- Acres/Population: 5.0 to 8.0 acres/1,000 pop.

Within the City of Lake Forest, strict adherence to the NRPA classification system for park facilities is difficult because there are instances where parks may function as both neighborhood and community parks.

City Parks

Existing City parks are shown on Figure 3.13-2, which includes all public parks as well as private parks that are open to the public.

The City adopted standard for park space acreage is 5.0 acres for every 1,000 people. The City's 2017 population was approximately 84,931. With 294 acres of parkland, the City currently provides 3.5 acres of parkland for every 1,000 people, which is below the City's standard of 5.0 acres for every 1,000 people. The deficit in park land is currently being offset with the recreational opportunities available in the Limestone/Whiting Wilderness Park, private parks, and other nearby regional parks.

Trails

Lake Forest's trail system includes pedestrian and bike trails within open space corridors and along regional trails. The County maintains a coordinated system of trails, including bikeways, equestrian trails and hiking trails within the City. There are a number of proposed improvements including: off-street bike trail connecting Aliso Creek Trail with Serrano Creek in the northern portion of the City and Foothill Transportation Corridor; a riding and hiking trail that would follow the Borrego Wash (partially completed); a connection between the Aliso Creek Trail and the Serrano Creek Trail; and a realignment of portions of Aliso Creek Riding and Hiking Trail. The location of the hiking trails, equestrian trails, and bicycle paths are shown on Figure 3.13-3.

Regional Parks

This category of park generally offers a wide range of recreational amenities or allows access to open space. It attracts and serves people from all over the community as well as surrounding areas. The County of Orange owns and operates a number of regional parks including: Limestone/Whiting Wilderness Park, Heritage Hill Historical Park, and the O'Neill Regional Park. The Cleveland National Forest, located just east of the City, also offers recreational opportunities.

SCHOOLS

The City of Lake Forest is served by the Saddleback Valley Unified School District as well as several parochial schools. Table 3.13-3 provides a summary of the schools serving the City's population.

TABLE 3.13-3: PUBLIC SCHOOLS SERVING LAKE FOREST

SCHOOL	*GRADES SERVED*	*ADDRESS*	*ENROLLMENT (2016-2017 SCHOOL YEAR)*	*AVERAGE CLASS SIZE*
ELEMENTARY SCHOOLS				
Foothill Ranch Elementary	K-6	1 Torino Drive	1,133	29.15
La Madera	K-6	25350 Serrano Road	626	27.26
Lake Forest	K-6	21801 Pittsford Drive	894	25
Olivewood Elementary	--	23391 Dune Mear Road	490	28.28
Ralph A. Gates Elementary	K-6	23882 Landisview Avenue	1,059	30.21
Rancho Canada Elementary	K-6	21801 Winding Way	696	26.81
Santiago Elementary	K-6	24982 Rivendell Drive	414	26.43
MIDDLE SCHOOLS				
Serrano Intermediate	7-8	24642 Jeronimo Road	1,233	30.38
PUBLIC HIGHSCHOOL & PAROCHIAL SCHOOLS				
El Toro High (Public)	9-12	25255 Toledo Way	2,548	29.29
Grace Christian	PK-6	26052 Trabuco Road	480	Pre-K: <12 Elem: <20
Heritage Christian	7-12	23302 El Toro Road	196	22[2]
Lake Forest Montessori	PK-1	2535 Trabuco Rd Ste 5	87	13
Arbor Christian	PK-6	23302 El Toro Road	81	<12
Abiding Savior Lutheran	PK-8	23262 El Toro Road	360	<25

SOURCES: GREAT SCHOOLS, SCHOOL PROFILES, AUGUST 2018, GREATSCHOOLS.ORG. PRIVATE SCHOOL REVIEW. HTTPS://WWW.PRIVATESCHOOLREVIEW.COM

OTHER PUBLIC FACILITIES

Library System

Lake Forest is part of the Orange County Public Library system. The Orange County Public Library has a network of 33 libraries of which two are in Lake Forest: Foothill Ranch Library, and the El Toro Library.

The El Toro Library is located at 24672 Raymond Way. The library is open from 10 am to 7 pm Monday through Thursday, and 9 am to 5 pm Friday through Sunday.

The Foothill Ranch Library is located at 27002 Cabriole Way. The library is open from 10 am to 7 pm Monday through Thursday, and 9 am to 5 pm on Saturday. The library is closed on Friday and Sunday.

Lake Forest City Hall

Lake Forest City Hall is currently located at 25550 Commercentre Drive. A new Civic Center is under construction that once complete will house not only City Hall, but a range of community services. The new facility will be 12.5 acres and is envisioned as a gathering place with public facilities to meet some of the community's current unmet needs. It will include a Senior Center,

City Hall, Council Chambers, Performing Arts Venue, Community Policing Center, and Community Center. The new Civic Center was designed along the following planning principles:

- Reflect Lake Forest. Emphasize the pastoral landscape, natural topography, and unique history that set Lake Forest apart from its neighbors.
- Be a destination. Develop the Civic Center complex as a destination through site location, architecture, and landscaping.
- Provide new amenities. Prioritize services at the Civic Center currently unavailable to the community.
- Accommodate multiple uses. Design the Civic Center buildings and amenities to accommodate multiple uses whenever possible.

Lake Forest Sports Park

The City of Lake Forest hosts a range of events and services at the Lake Forest Sports Park. The Sports Park includes a 27,000 square foot Recreation Center with a gymnasium, classrooms, and activity rooms. The City hosts a range of classes, youth and teen camps, special events, the preschool program, and youth and adult sports at this facility.

The 57-acre Sports Park opened in November 2014, and is one of the largest sports parks in Orange County. It includes a variety of amenities including:

- 5 Baseball/Softball Diamonds
- 3-Acre Common Lawns
- 27,000 Square Foot Recreation Center/Gymnasium
- Outdoor Exercise Equipment
- 2 Restroom and Concession Buildings
- 2 Synthetic Turf Soccer Fields with spectator seating areas
- 2 Outdoor Basketball Courts
- 8 Gazebo Picnic Structures
- 2 Playgrounds/Tot Lots
- Pet Friendly Park
- Free Wifi

3.13.2 REGULATORY SETTING

FEDERAL

There are no Federal regulations applicable to the environmental topics of public services and recreation.

STATE AND LOCAL

Fire Protection and Emergency Response

CALIFORNIA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

In accordance with California Code of Regulations Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment" the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all fire fighting and emergency medical equipment.

EMERGENCY RESPONSE/EVACUATION PLANS

The State passed legislation authorizing the Office of Emergency Services (OES) to prepare a Standard Emergency Management System (SEMS) program, which sets forth measures by which a jurisdiction should handle emergency disasters. Non-compliance with SEMS could result in the State withholding disaster relief from the non-complying jurisdiction in the event of an emergency disaster.

FIRE PROTECTION

The California Fire Code contains regulations relating to construction and maintenance of buildings and the use of premises. Topics addressed in the Code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions to protect and assist first responders, industrial processes, and many other general and specialized fire safety requirements for new existing buildings and premises.

UNIFORM FIRE CODE

The Uniform Fire Code with the State of California Amendments contains regulations relating to construction, maintenance, and use of buildings. Topics addressed in the California Fire Code include fire department access, fire hydrants, automatic sprinkler systems, fire alarm systems, fire and explosion hazards safety, hazardous materials storage and use, provisions intended to protect and assist fire responders, industrial processes, and many other general and specialized fire-safety requirements for new and existing buildings and the surrounding premises. The Fire Code contains specialized technical regulations related to fire and life safety.

CALIFORNIA HEALTH AND SAFETY CODE

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code. This includes regulations for building standards (as also set forth in the California Building

Code), fire protection and notification systems, fire protection devices such as extinguishers and smoke alarms, high-rise building and childcare facility standards, and fire suppression training.

Parks and Recreation

CITY OF LAKE FOREST MUNICIPAL CODE

Title 13, Parks and Recreational Facilities, of the Lake Forest Municipal Code addresses the Parks and Recreation Commission, Operational Policies, Facilities, Skatepark Regulation, User Fees, Camping and Storage of Personal Property on Public Property, and the Naming of City Property.

QUIMBY ACT

The Quimby Act (California Government Code Section 66477) states that "the legislative body of a city or county may, by ordinance, require the dedication of land or impose a requirement of the payment of fees in lieu thereof, or a combination of both, for park or recreational purposes as a condition to the approval of a tentative or parcel map." Requirements of the Quimby Act apply only to the acquisition of new parkland and do not apply to the physical development of new park facilities or associated operations and maintenance costs. The Quimby Act seeks to preserve open space needed to develop parkland and recreational facilities; however, the actual development of parks and other recreational facilities is subject to discretionary approval and is evaluated on a case-by-case basis with new residential development. The City has adopted park fees as allowed by the Quimby Act, as described in greater detail below.

Schools

CALIFORNIA CODE OF REGULATIONS

The California Code of Regulations, Chapter 4.9, Payment of Fees, Charges, Dedications, or Other Requirements Against a Development Project. *Section 65995-65998 (h)* The payment or satisfaction of a fee, charge, or other requirement levied or imposed pursuant to Section 17620 of the Education Code in the amount specified in Section 65995 and, if applicable, any amounts specified in Section 65995.5 or 65995.7 are hereby deemed to be full and complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization as defined in Section 56021 or 56073, on the provision of adequate school facilities.

CALIFORNIA DEPARTMENT OF EDUCATION

The California Department of Education (CDE) School Facilities Planning Division (SFPD) prepared a School Site Selection and Approval Guide that provides criteria for locating appropriate school sites in the State of California. School site and size recommendations were changed by the CDE in 2000 to reflect various changes in educational conditions, such as lowering of class sizes and use of advanced technology. The expanded use of school buildings and grounds for community and agency joint use and concern for the safety of the students and staff members also influenced the modification of the CDE recommendations.

Specific recommendations for school size are provided in the School Site Analysis and Development Guide. This document suggests a ratio of 1:2 between buildings and land. CDE is aware that in a number of cases, primarily in urban settings, smaller sites cannot accommodate this ratio. In such cases, the SFPD may approve an amount of acreage less than the recommended gross site size and building-to-ground ratio.

Certain health and safety requirements for school site selection are governed by state regulations and the policies of the SFPD relating to:

- Proximity to airports, high-voltage power transmission lines, railroads, and major roadways;
- Presence of toxic and hazardous substances;
- Hazardous facilities and hazardous air emissions within one-quarter mile;
- Proximity to high-pressure natural gas lines, propane storage facilities, gasoline lines, pressurized sewer lines, or high-pressure water pipelines;
- Noise;
- Results of geological studies or soil analyses; and
- Traffic and school bus safety issues.

THE KINDERGARTEN-UNIVERSITY PUBLIC EDUCATION FACILITIES BOND ACT OF 2002 (PROP 47)

This act was approved by California voters in November 2002 and provides for a bond issue of $13.05 billion to fund necessary education facilities to relieve overcrowding and to repair older schools. Funds will be targeted at areas of greatest need and must be spent according to strict accountability measures. Funds will also be used to upgrade and build new classrooms in the California Community Colleges, the California State University, and the University of California in order to provide adequate higher education facilities to accommodate growing student enrollment.

LEROY F. GREENE SCHOOL FACILITIES ACT OF 1998 (SB 50)

The “Leroy F. Greene School Facilities Act of 1998,” also known as Senate Bill 50 or SB 50 (Chapter 407, Statutes of 1998), governs a school district’s authority to levy school impact fees. This comprehensive legislation, together with the $9.2 billion education bond act approved by the voters in November 1998 known as “Proposition 1A”, reformed methods of school construction financing in California. SB 50 instituted a new school facility program by which school districts can apply for state construction and modernization funds. It imposed limitations on the power of cities and counties to require mitigation of school facilities impacts as a condition of approving new development and provided the authority for school districts to levy fees at three different levels:

- Level I fees are the current statutory fees allowed under Education Code 17620. This code section provides the basic authority for school districts to levy a fee against residential and commercial construction for the purpose of funding school construction or reconstruction of facilities. These fees vary by district for residential construction and commercial construction and are increased biannually.

- Level II fees are outlined in Government Code Section 65995.5, allowing school districts to impose a higher fee on residential construction if certain conditions are met. These conditions include having a substantial percentage of students on multi-track year-round scheduling, having an assumed debt equal to 15–30 percent of the district's bonding capacity (percentage is based on revenue sources for repayment), having at least 20 percent of the district's teaching stations housed in relocatable classrooms, and having placed a local bond on the ballot in the past four years which received at least 50 percent plus one of the votes cast. A Facility Needs Assessment must demonstrate the need for new school facilities for unhoused pupils is attributable to projected enrollment growth from the construction of new residential units over the next five years.

- Level III fees are outlined in Government Code Section 655995.7. If State funding becomes unavailable, this code section authorizes a school district that has been approved to collect Level II fees to collect a higher fee on residential construction. This fee is equal to twice the amount of Level II fees. However, if a district eventually receives State funding, this excess fee may be reimbursed to the developers or subtracted from the amount of state funding.

3.13.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on public services and recreation if it would result in:

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
    - Fire Protection;
    - Police Protection;
    - Schools;
    - Parks; and
    - Other public facilities.
- An increase in the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or
- If it includes recreational facilities or requires the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

IMPACTS AND MITIGATION MEASURES

Impact 3.13-1: General Plan implementation could result in adverse physical impacts on the environment associated with the need for new governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts and the provision of public services (Less than Significant)

Development accommodated under the General Plan would result in additional residents and businesses in the City, including new residential, industrial, office, and commercial uses. As described in Chapter 2.0, the General Plan is expected to accommodate up to 22,406 new residential dwelling units and up to 12,410,885 square feet of non-residential building space within the city limits at full buildout.

This new growth within the City limits would increase the City's population by up to 70,574 residents and would include approximately 14,202 new jobs. The full development of the new non-residential uses shown in Chapter 2.0 (Project Description) Table 2.0-2.

Development and growth facilitated by the General Plan would result in increased demand for public services, including fire protection, law enforcement, schools, parks, libraries, and other public and governmental services. The General Plan includes policies and actions to ensure that public services are provided at acceptable levels and that the City will maintain and implement public facility master plans, in collaboration with appropriate outside service providers and other agencies, to ensure compliance with appropriate regional, state, and federal laws and to provide efficient public facilities and services to Lake Forest.

As the demand for services increases, there will likely be a need to address acceptable service ratios, response times, and other performance standards. New or expanded service structures (e.g., offices, maintenance and administrative buildings, schools, parks, fire facilities, libraries, etc.) will be needed to provide for adequate staffing, equipment, and appropriate facilities to serve growth in the city. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

Existing facilities may be expanded at their current location. New facilities may also be constructed. The Public Facility and Community Park/Open Space land use designations would accommodate the majority of new public facilities necessary to provide community services. There would likely be environmental impacts associated with the construction or expansion of the facilities needed to provide public services.

The General Plan does not propose or approve actual development projects, or the physical expansion of public facilities. As future development and infrastructure projects (including new governmental facilities) are considered by the City, each project will be evaluated for conformance with the General Plan, Municipal Code, and other applicable regulations. Such development and

infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. Any future expansion of public facilities required by growth in the City would be required to be reviewed for site-specific impacts.

As previously stated, new facilities will be needed to serve growth contemplated in the General Plan. The environmental effect of providing the public services is associated with the physical impacts of providing new and expanded facilities. The specific impacts of providing new and expanded facilities cannot be determined at this time, as the General Plan does not propose or authorize development nor does it designate specific sites for new or expanded public facilities. However, the facilities would be primarily provided on sites with land use designations that allow such uses and the environmental impacts of constructing and operating the governmental facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the General Plan. These impacts are described in the relevant chapters (Chapters 3.1 through 3.16, and 4.0) of this Draft EIR. Any future development under the General Plan would be required to comply with regulations, policies, and standards included in the General Plan, and would be subject to CEQA review as appropriate.

The General Plan includes a range of policies and actions (listed below) to ensure that public services are provided in a timely fashion, are adequately funded, are coordinated between the City and appropriate service agency, and that new development funds its fair share of services. Therefore, impacts related to the provisions and need for public facilities are **less than significant**.

GENERAL PLAN POLICIES THAT MITIGATE POTENTIAL IMPACTS

PF-1.1: Public Facility Plans. Maintain and implement public facility master plans, in collaboration with appropriate outside service providers and other agencies, to ensure compliance with appropriate regional, state, and federal laws and to provide efficient public facilities and services to Lake Forest.

PF-1.2: Revenue Sources. Identify and proactively pursue local, stable and predictable sources of revenue to meet public facility, service, and infrastructure needs.

PF-1.3: Capital Improvements. Maintain and fund the capital improvement program to ensure the adequate and efficient provision of public facility and municipal improvements.

PF-1.4: Impact on Resources. Require new utility infrastructure to avoid sensitive natural and cultural resources to the greatest extent feasible.

PF-1.5: Private Sector. Pursue public private partnerships to assist in funding the provision of public facilities and services. Encourage new large-scale development projects to incorporate community features such as meeting spaces/rooms that may be used by community organizations.

PF-1.6: Infrastructure Rehabilitation. Prioritize the regular maintenance and rehabilitation of public facilities and critical infrastructure to extend its useful life.

PF-2.1: New Development. Require that new development participates in the provision and expansion of public services, recreational amenities, and facilities.

PF-2.2: Demonstrate Capacity. Require new development to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with the project as part of the entitlement process.

PF-2.3: Mitigate Impacts. Require new development to offset or mitigate impacts to community services and facilities to ensure that service levels for existing users are not degraded or impaired by new development, to the satisfaction of the City.

PF-2.4: Mixed-use Developments. Encourage mixed-use developments along major corridors and around activity and employment centers, as defined in the Land Use Element, to reduce public service costs and environmental impacts through compatible land use relationships, and efficient circulation and open space systems.

PF-8.1: Police and Fire Department Facilities. Encourage the Orange County Fire Authority and the Orange County Sheriff's Department to maintain adequate staff and equipment to provide efficient, high quality, and responsive fire protection and emergency medical services to existing and future growth in Lake Forest.

PF-8.2: Emergency Response Times. Work cooperatively with the Orange County Fire Authority, Orange County Sheriff's Department, and providers of emergency medical services to ensure acceptable response times in accordance with provider standards.

PF-9.2: Adequate Facilities. Continue to engage Saddleback Valley Unified School District in the environmental review process for land use changes so that they can provide adequate educational opportunities for all students in a timely manner in accordance with the pace of residential development.

PF-10.1: Cooperation. Encourage cooperation and coordination between and among cities in Orange County for delivery of services to the public.

PF-10.2: Regional Issues. Continue to participate in the preparation of plans and programs addressing regional infrastructure and public services issues.

PF-10.3: Cost Sharing. Explore equitable methods for sharing the costs of facilities or services that serve multiple jurisdictions in Orange County.

PF-10.4: Regional Services Providers. Collaborate with the various regional facility and service providers to deliver the highest level of service to Lake Forest residents, and to plan for new development.

PF-10.5: Regional Public Facilities. Consider the capacity of regional public facilities and services when reviewing land use changes.

PF-10.6: Capital Improvement Planning. Encourage agencies to carry out long-range capital improvement planning, which includes funding methods for the construction of projects that are compatible with regional land use planning goals and objectives.

Impact 3.13-2: General Plan implementation may result in adverse physical impacts associated with the deterioration of existing parks and recreation facilities or the construction of new parks and recreation facilities (Less than Significant)

Growth accommodated under the General Plan would include a range of uses that could increase the population of the City and also attract additional workers and tourists to the City. Such growth would result in increased demand for parks and recreation facilities. It is anticipated that over the life of the General Plan, use of parks, trails, and recreation facilities would increase, due to new residents and businesses. The additional demand on existing parks and recreational facilities would increase the need for maintenance and improvements. These improvements could have environmental impacts, although the exact impacts cannot be determined since the potential improvements are unknown.

The provision of new parks and recreation facilities would reduce the potential for adverse impacts and physical deterioration of existing parks and recreation facilities, by providing additional facilities to accommodate the demand for parks and recreation facilities. These new facilities would be provided at a pace and in locations appropriate to serve new development, as required to maintain the City adopted standard for park space acreage at 5.0 acres for every 1,000 residents (as required by General Plan Policy RR-1.3). Development under the General Plan would indirectly lead to the construction of new parks and recreation facilities to serve new growth and to meet existing parks and recreation needs. The General Plan supports the creation of new parks and recreation facilities, including new parks and trails, to accommodate a wide range of activities for all age groups. These new parks and recreation facilities would be spread throughout areas proximate to new development in and around existing neighborhoods. Neighborhood and community parks and trails would generally be accommodated in the Community Park/Open Space, Regional Park/Open Space, and Open Space Land use designations.

General Plan Policy RR-1.3 establishes a citywide ratio of five acres of parkland per 1,000 residents. The City currently provides approximately 3.5 acres of parkland for every 1,000 people. The deficit in park land is currently being offset with the recreational opportunities available in the Limestone/Whiting Wilderness Park, private parks, and other nearby regional parks.

As shown in Table 2.0-2, the projected total buildout population (which includes existing plus projected population growth) is 152,462. At a ratio of five acres of parkland per 1,000 residents, buildout of the General Plan within the City limits would result in a demand for 762 acres of developed parkland, or 468 acres of developed parkland in addition to the existing stock of 294 developed acres, if the City's population levels were to reach the buildout population potential of the proposed General Plan.

The projected additional population (which excludes existing population) as a result of buildout of the General Plan land use map (as detailed in Chapter 2.0) is 70,574. At a ratio of five acres of parkland per 1,000 residents, buildout of the General Plan within the City limits would result in a demand for 353 acres of developed parkland. It should be noted that new development would be

required to fund its fair share for required parkland but would not make up for existing system deficiencies.

The General Plan does not specifically propose any development projects, including parks. As a result, site-specific physical impacts of future park development and construction cannot be determined until future projects are brought forward for review. As future parks and recreation projects are considered by the City, each project will be evaluated for conformance with the General Plan, Municipal Code, and other applicable regulations. Parks and recreation projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA.

In addition to ensuring that new and expanded parks and recreation facilities are provided to accommodate new growth, the General Plan includes policies and actions to ensure that parks and recreation facilities are adequately maintained and improved to serve both existing and planned growth.

The General Plan does not propose or approve any development nor does it designate specific sites for new or expanded parks and recreational facilities. The General Plan includes a range of policies and actions (listed below) to ensure that parks and recreational facilities are adequately funded, and that new development funds its fair share of services needed to meet General Plan objectives. New development is required to participate in the provision and expansion of public services, recreational amenities, and facilities, and is also required to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with future projects during the entitlement process.

The General Plan does not propose or approve the construction or expansion of parks or recreational facilities. Any new parks or recreational facilities that may be constructed in the future would be primarily provided on sites with land use designations that allow such uses and the environmental impacts of constructing and operating the parks and recreational facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the General Plan. These impacts are described in the relevant chapters (Chapters 3.1 through 3.16, and 4.0) of this Draft EIR. Any future development under the General Plan would be required to comply with regulations, policies, and standards included in the General Plan, and would be subject to CEQA review as appropriate.

Therefore, impacts related to the provisions and need for park and recreational facilities are **less than significant**.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

RR-1.1: Recreation Types. Provide residents a wide variety of public and private recreational lands, facilities, trails, and recreational amenities to foster a comprehensive system for residents that is usable for a diverse community.

RR-1.2: Proximity. Maintain a public park and trail system that is accessible to all parts of the City.

RR-1.3: Acreage Requirements. Maintain the City adopted standard for park space acreage at 5.0 acres for every 1,000 residents; require all new development projects to satisfy this standard.

RR-1.4: Design and Maintenance. Promote implementation of established design, construction, and facility maintenance standards to ensure that existing and future City amenities are of high quality in regard to safety, utility, environmental stewardship, and aesthetic quality.

RR-1.5: Innovative Design. Maintain and update design standards for City parks and trails based on proven best practices and innovations in public safety, active transportation, and recreation planning.

RR-1.6: Maximized Use. Maximize the utilization of existing parks, recreational facilities, and open space within Lake Forest, without degrading the quality of the facility, as financially feasible.

RR-1.7: Trail System. Promote park and open space connectivity by expanding the integrated system of trails within Lake Forest to connect local bikeways, equestrian trails, and hiking trails to regional trails, open space areas, residential neighborhoods, employment centers, and mixed-use activity centers.

RR-1.8: Funding. Continue to pursue funding from established sources and explore non-traditional funding options and innovative partnerships to bolster and support the development, improvement, and maintenance of City parks and recreational amenities.

RR-1.9: Landscaping. Protect local and regional resources by fortifying new parks and recreational development with sustainable drought-tolerant landscaping.

RR-1.10: Accessibility. Require that any park construction and any new development on existing park facilities meet the accessibility standards defined by the Americans with Disabilities Act (ADA) and playground safety requirements (Senate Bill 2733).

RR-1.11: Public Input. Promote a high level of public outreach regarding park and recreation opportunities and facility design in Lake Forest.

RR-1.12: Maintenance Costs. Explore ways to reduce maintenance costs at City park and recreation facilities.

R-2.1: Open Space Boundaries. Maintain the amount of existing open space within the City of Lake Forest by carefully considering the impact of new development in established open space areas.

RR-2.2: Regional Partners. Coordinate with regional partners to maintain and preserve open space areas under overlapping jurisdiction or within nearby communities to protect all local and regional opportunities for recreation available to Lake Forest residents.

PF-1.1: Public Facility Plans. Maintain and implement public facility master plans, in collaboration with appropriate outside service providers and other agencies, to ensure compliance with appropriate regional, state, and federal laws and to provide efficient public facilities and services to Lake Forest.

PF-1.2: Revenue Sources. Identify and proactively pursue local, stable and predictable sources of revenue to meet public facility, service, and infrastructure needs.

PF-1.3: Capital Improvements. Maintain and fund the capital improvement program to ensure the adequate and efficient provision of public facility and municipal improvements.

PF-1.4: Impact on Resources. Require new utility infrastructure to avoid sensitive natural and cultural resources to the greatest extent feasible.

PF-1.6: Infrastructure Rehabilitation. Prioritize the regular maintenance and rehabilitation of public facilities and critical infrastructure to extend its useful life.

PF-2.1: New Development. Require that new development participates in the provision and expansion of public services, recreational amenities, and facilities.

PF-2.2: Demonstrate Capacity. Require new development to demonstrate that the City's public services and facilities can accommodate the increased demand for said services and facilities associated with the project as part of the entitlement process.

PF-2.3: Mitigate Impacts. Require new development to offset or mitigate impacts to community services and facilities to ensure that service levels for existing users are not degraded or impaired by new development, to the satisfaction of the City.

PF-10.1: Cooperation. Encourage cooperation and coordination between and among cities in Orange County for delivery of services to the public.

PF-10.2: Regional Issues. Continue to participate in the preparation of plans and programs addressing regional infrastructure and public services issues.

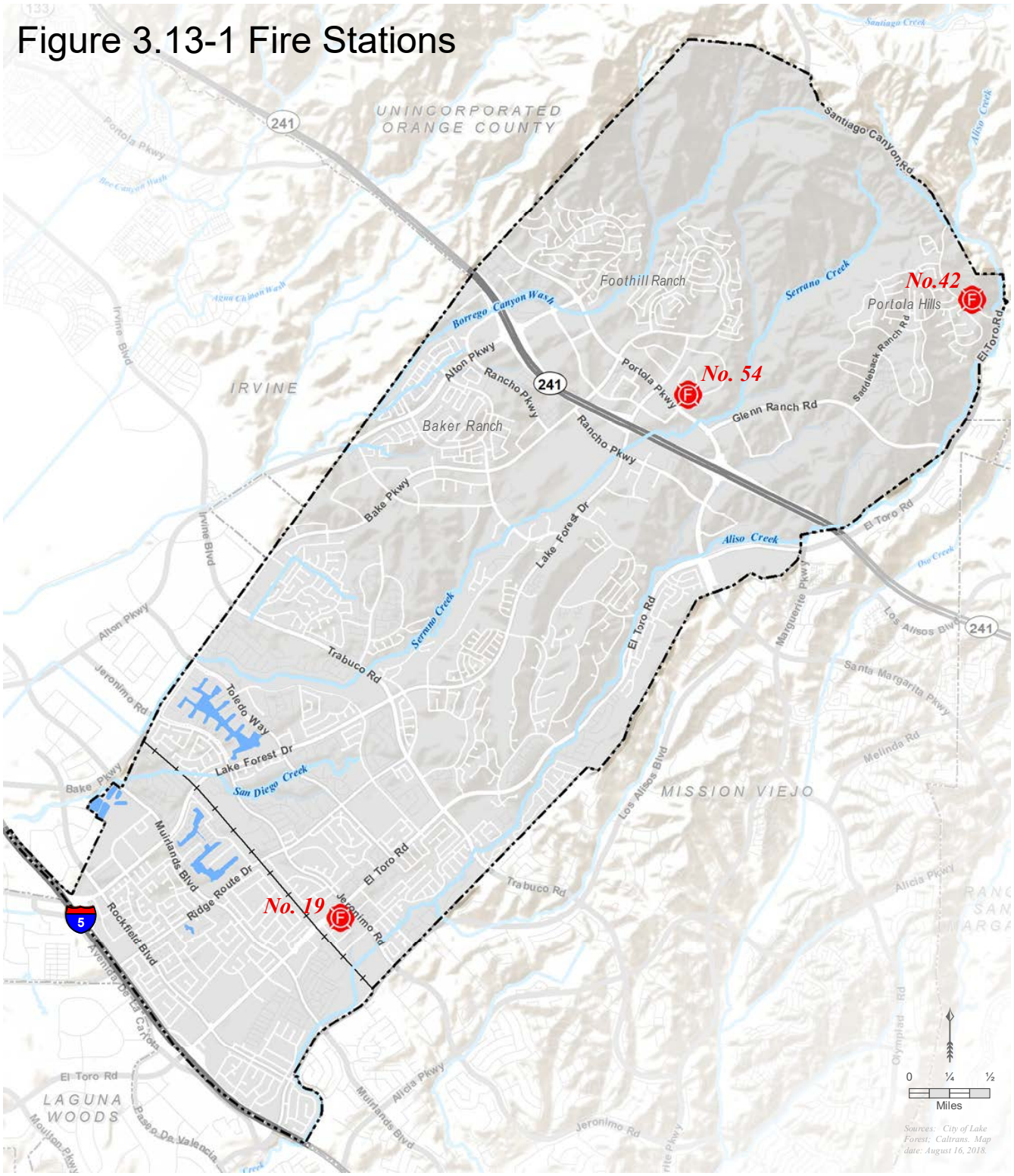
PF-10.3: Cost Sharing. Explore equitable methods for sharing the costs of facilities or services that serve multiple jurisdictions in Orange County.

PF-10.4: Regional Services Providers. Collaborate with the various regional facility and service providers to deliver high levels of service to Lake Forest residents, and to plan for new development.

PF-10.5: Regional Public Facilities. Consider the capacity of regional public facilities and services when reviewing land use changes.

PF-10.6: Capital Improvement Planning. Encourage agencies to carry out long-range capital improvement planning, which includes funding methods for the construction of projects that are compatible with regional land use planning goals and objectives.

Figure 3.13-1 Fire Stations



Legend

- City of Lake Forest
- Other City Boundaries
- Orange County Fire Authority (OCFA) Station

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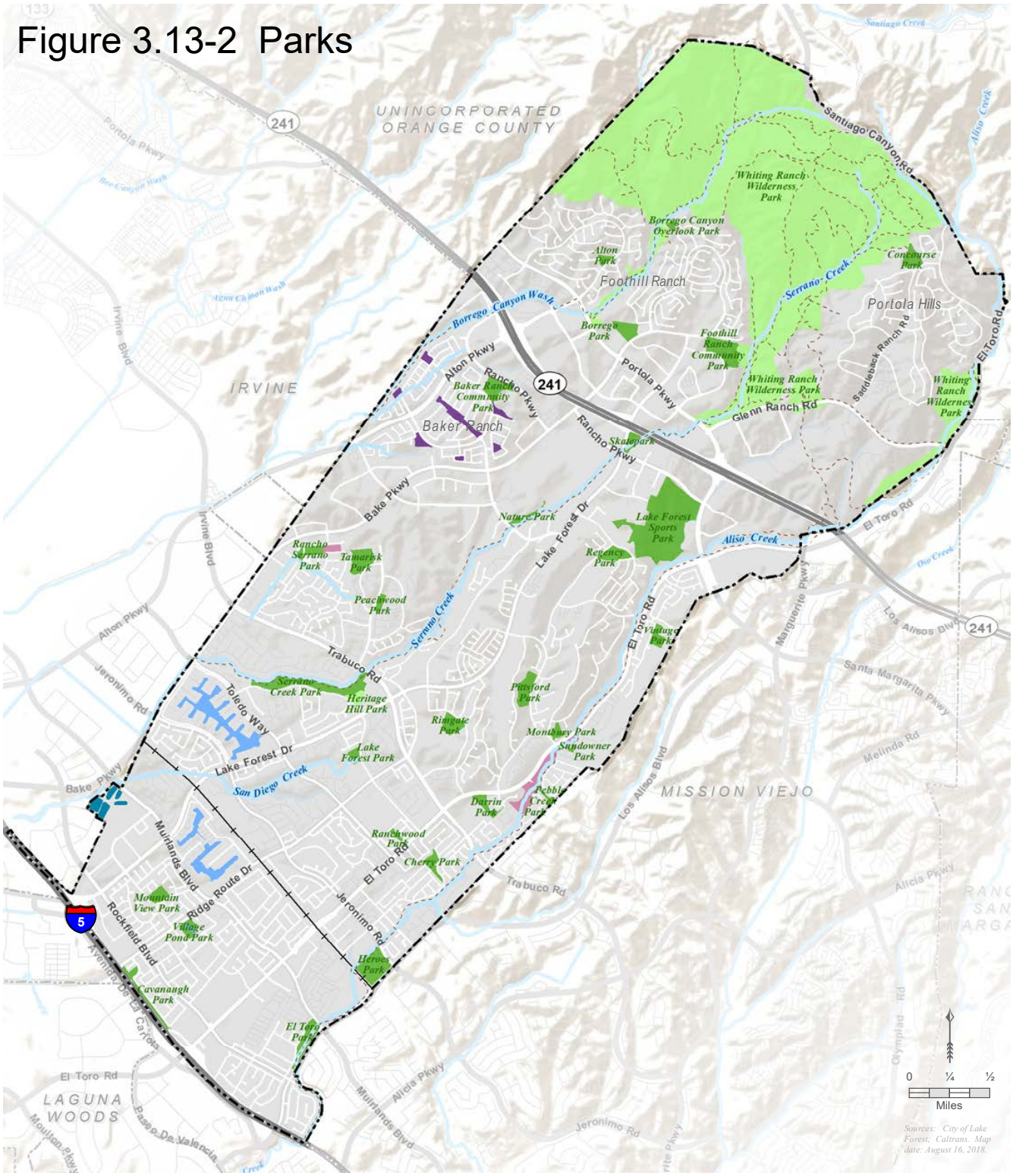
Figure 3.13-2 Parks



Legend

- City of Lake Forest
- Other City Boundaries
- Riding & Hiking Trails
- City Park
- County Park
- Private Park
- Private Park (Proposed)

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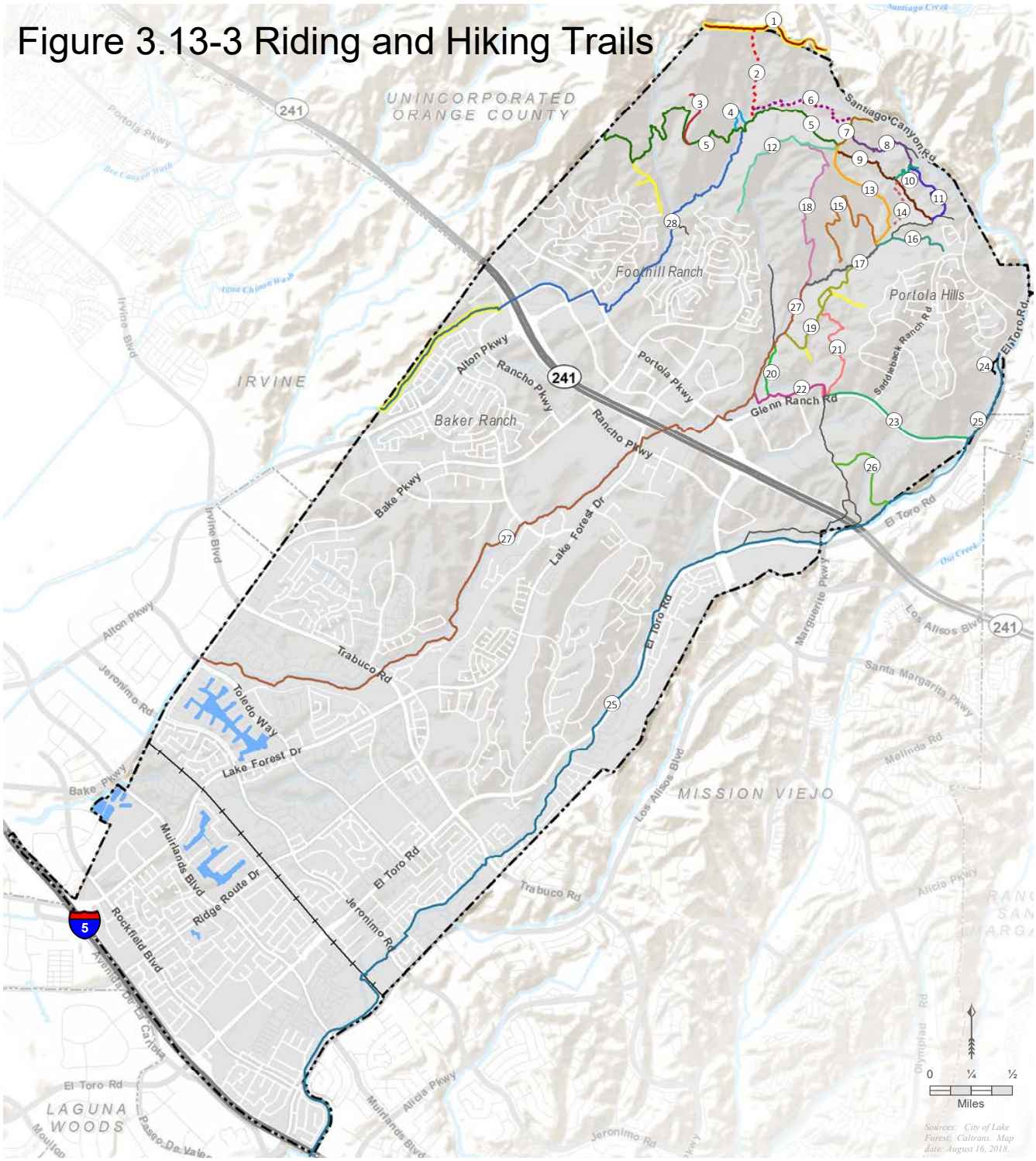
Figure 3.13-3 Riding and Hiking Trails



Legend

- Closed Trail
- Unnamed Trail
- 1-Bolero Lookout Road
- 2-Red Rock Trail (Hiking Only)
- 3-Vista Lookout Trail
- 4-Cattle Pond Loop
- 5-Mustard Road
- 6-Billy Goat Trail (Hiking Only)
- 7-Whiting Spur Road
- 8-Upper Pond Trail
- 9-Cactus Hill Trail
- 10-Santiago Ranch Road
- 11-Sage Scrub Trail
- 12-Water Tank Road
- 13-Whiting Road
- 14-Sleepy Hollow Trail (Hiking Only)
- 15-Edison Road
- 16-Whiting Access
- 17-Serrano Cow Trail
- 18-Dreaded Hill Road
- 19-Line Shack Road
- 20-Live Oak Trail
- 21-Coyote Brush Road
- 22-Raptor Road
- 23-Aliso-Serrano Trail
- 24-Mcfadden Ranch House Access
- 25-Aliso Creek Trail
- 26-Edison Riding & Hiking Trail
- 27-Serrano Creek Trail
- 28-Borrego Trail

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This chapter describes the potential impacts to the transportation system associated with adoption and implementation of the General Plan. The impact analysis examines the roadway, transit, bicycle, and pedestrian components of the City's transportation system. To provide a context for the impact analysis, this chapter begins with the environmental setting, which is a description of the existing physical and operational conditions for the transportation system. Following the setting is the regulatory framework influencing the transportation system and providing the basis for impact significance thresholds used in the impact analysis. The chapter concludes with the impact analysis findings and recommended mitigation measures. This section is based on the Transportation Impact Analysis (TIA) prepared by Kittelson & Associates, Inc. (Appendix F of this Draft EIR).

In addition to the transportation analysis conducted under the requirements of the California Environmental Quality Act (CEQA), the TIA also analyzed roadway segment and intersection operations associated with General Plan implementation, to address the City's goal of providing satisfactory roadway operations and traffic flow within Lake Forest. Recommended improvements on these facilities were provided to accommodate long-term buildout of vehicular traffic. The results and recommendations of this level of service (LOS) analysis are contained in the TIA, which is included as Appendix F of this EIR. Under SB 743 as of July 1, 2020, local agencies may no longer rely on roadway/intersection delay and capacity-based analyses for CEQA purposes, but rather, agencies must analyze transportation impacts utilizing vehicle miles travelled ("VMT"), which measures the number of vehicle trips generated by a project and their average distance of travel to and from a project. These are calculated and assessed on a per rate basis (e.g. per capita for residential projects or per employee for commercial projects. This is a change from the prior method of analyzing transportation impacts, which measured levels of service ("LOS") at intersections and roadway segments, graded from LOS A to LOS F. Per SB 743, after July 1, 2020, LOS will no longer be the threshold to measure transportation impacts, however, LOS may be relevant goals and policies in a local agency's general plan. Given that LOS is no longer a CEQA-related topic, this LOS analysis is not discussed in this chapter.

Comments were received during the public review period or scoping meeting for the Notice of Preparation regarding this topic from the following: California Department of Transportation (Caltrans) (October 3, 2019) and Orange County Transportation Authority (OCTA) (October 4, 2019). Caltrans provided comments pertaining to the scope of the TIA, and OCTA provided comments pertaining to the Master Plan of Arterial Highways (MPAH). Each of the comments related to this topic are addressed within this section. Full comments received are included in Appendix A.

3.14.1 ENVIRONMENTAL SETTING

The existing physical and operational conditions for Lake Forest's transportation system are based on review of local and regional transportation plans, as well as physical review of the existing transportation system, as described below. Descriptions are organized by transportation system component beginning with the roadway network, followed by the pedestrian and bicycle network and transit system.

EXISTING ROADWAY NETWORK

The roadway system in Lake Forest consists of arterial roadways as well as regional freeways that serve local and regional traffic demand. The existing vehicular facilities in Lake Forest are discussed below.

Local Arterial Roadways

Roadways within Lake Forest are classified in the current Circulation Element (revised 2008) of the 1994 Lake Forest General Plan as principal arterials, major arterials, primary arterials, secondary arterials, and commercial streets; these classifications are shown in Figure 3.14-1.

- **Principal Arterials**. According to the current Circulation Element, principal arterials generally have eight lanes and a raised median with a daily capacity of approximately 70,000 vehicles. On-street parking and left-turns at unsignalized minor street and driveway intersections are typically prohibited.
- **Major Arterials**. Major arterials generally have six lanes and a raised median with a daily capacity of approximately 56,000 vehicles. On-street parking is typically prohibited. In addition, signalized intersections are preferable to unsignalized intersections along major arterials.
- **Primary Arterials**. Primary arterials generally have four lanes and a painted or raised median with a daily capacity of approximately 36,000 vehicles. Similar to other arterial classifications in Lake Forest, on-street parking is typically prohibited.
- **Secondary Arterials**. Secondary arterials generally have four lanes without a painted or raised median. The daily capacity for a secondary arterial is approximately 25,000 vehicles. Unlike principal, major, and primary arterials, secondary arterials can provide on-street parking and access via unsignalized intersections at minor streets.
- **Commercial Streets**. The current Circulation Element recognizes that certain streets near commercial centers can have different daily traffic patterns compared to arterials in areas that are predominantly residential. For example, streets in commercial areas experience heavier traffic volumes after the morning peak hour and during non-peak hours compared to residential areas. Due to these unique characteristics, certain arterials in commercial areas are designated as commercial streets.

Individual arterials in Lake Forest and their current classifications are described below. In general, the north-south roadways provide connections to neighboring cities such as Mission Viejo and Irvine, and the east-west roadways connect Lake Forest to Laguna Woods, Cleveland National Park, State Route 241 (SR-241), and Interstate 5 (I-5).

El Toro Road is an east-west road connecting I-5 to SR- 241. It serves commercial centers and provides access to several neighborhoods. There are four 11-foot travel lanes in each direction between I-5 and Muirlands Boulevard. North of Muirlands Boulevard, El Toro has three travel lanes in each direction. Opposing travel lanes are separated by a painted median and two-way left turn lane. There are sidewalks on both sides of the street, except between Creekside and Raintree Lane, where there is only a sidewalk on the west side. The Aliso Creek bikeway, a shared use path, runs along the south side of the street between Normandale Drive and Live Oak Canyon Road. The posted speed limit is 55 miles per hour (mph) east of North Crest, 50 mph between North Crest and Jeronimo Road, and 40 mph west of Jeronimo Road. On-street parking is not permitted. El Toro Road is classified as a major arterial east of Trabuco Road, a principal arterial between Trabuco Road and Muirlands Boulevard, and a commercial street between Muirlands Boulevard and I-5.

Lake Forest Drive is an east-west road connecting I-5 to SR-241. It serves commercial centers and provides access to several neighborhoods. There are three 11-foot travel lanes in each direction west of Trabuco Road and two travel lanes in each direction east of Trabuco Road. Opposing travel lanes are separated by a raised median. Sidewalks are present along both sides of the roadway throughout the City. On-street parking is not permitted. Lake Forest Drive has Class II bike lanes on both sides of the street, between Portola Parkway and

Muirlands Boulevard. The posted speed limit varies between 40 mph and 55 mph. Lake Forest Drive is classified as a commercial street from Portola Parkway to Rancho Parkway, a primary arterial from Rancho Parkway to Trabuco Road, a major arterial from Trabuco Road to Muirlands Boulevard, and a commercial street from Muirlands Boulevard to I-5.

Alton Parkway is an east-west road traveling between Portola Parkway, SR-241, and the westerly City limit, providing connectivity from Foothill Ranch to I-5 and I-405. There are three 11- to 12-foot travel lanes in each direction, separated by a raised median. There are sidewalks on both sides of the street and Class II bike lanes are provided west of Portola Parkway. The posted speed limit is 40 mph. Alton Parkway is classified as a major arterial.

Bake Parkway is an east-west road running between Portola Parkway and the City limits and providing connectivity from Foothill Ranch to I-5. There are two 11- to 12-foot travel lanes in each direction, separated by a raised median. Sidewalks and Class II bike lanes are provided on both sides of the street. The posted speed limit is 50 mph. Bake Parkway is classified as a commercial street east of Rancho Parkway, a primary arterial between Rancho Parkway and Pointe Drive, and a major arterial west of Pointe Drive.

Los Alisos Boulevard is an east-west roadway running along a portion of the easterly City limits. Within Lake Forest, Los Alisos Boulevard mainly serves residential neighborhoods. There are three 11-foot travel lanes in each direction, separated by a raised median. Sidewalks and Class II bike lanes are provided along both sides of the roadway. On-street parking is not permitted. The posted speed limit is 45 mph. Los Alisos Boulevard is classified as a major arterial.

Portola Parkway is a north-south roadway traveling parallel to and across SR-241, between the city boundaries with Irvine and Mission Viejo. East of SR 241, there are two to three 11- to 12-foot travel lanes in each direction, separated by a raised median. West of SR 241, there are three 11 to 12-foot travel lanes. Sidewalks and Class II bike lanes are provided along both sides of the roadway. On-street parking is not permitted. The posted speed limit is 45 mph. Portola Parkway is classified as a primary arterial north of Alton Parkway, a major arterial between Alton Parkway and SR-241, a major arterial between SR-241 and El Toro Road, and a major arterial south of El Toro Road. Portola Parkway presently terminates at the City's northwest limits (past Paloma). The OCTA MPAH shows Portola Parkway's future alignment as continuous between the northerly City limits and SR-241 within Irvine.

Trabuco Road is a north-south roadway, bisecting Lake Forest. There are three 11- to 12-foot travel lanes in each direction north of El Toro Road and two travel lanes in each direction south of El Toro Road, separated by a raised median. Sidewalks are present on both sides of the road, except for a short extent on the Aliso Creek bridge. Class II bike lanes are provided along both sides of the roadway. On-street parking is not permitted. The posted speed limit is 45 mph. Trabuco Road is classified as a major arterial. North of Bake Parkway (in Irvine) this roadway is known as Irvine Boulevard.

Toledo Way is a north-south roadway, extending from Alton Parkway (in Irvine) to El Toro Road. There are two 10- to 12-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks are present on both sides of the road. Class II bike lanes are available on both sides of the street north of Ridge Route Drive. On-street parking is permitted on the east side of Toledo Way between El Toro Road and El Toro High School. The posted speed limit varies between 45 and 50 mph; between Ridge Route Drive and El Toro Road

(adjacent to El Toro High School), the speed limit is 25 mph when children are present. Toledo Way is classified as a secondary arterial.

Jeronimo Road is a north-south roadway, bisecting Lake Forest. There are two 10- to 12-foot travel lanes in each direction; opposing travel lanes are separated by a two-way left turn lane north of El Toro Road and by a raised median south of El Toro Road. Sidewalks and Class II bike lanes are provided on both sides of the road. On-street parking is not permitted except on the west side in front of the commercial center between Orange Avenue and Cherry Avenue. The posted speed limit varies between 40 and 45 mph; adjacent to Serrano Middle School, the speed limit is 25 mph when children are present. Jeronimo Road is classified as a primary arterial.

Muirlands Boulevard is a north-south roadway, providing access to residential and commercial uses in Lake Forest. There are two 11- to 14-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks and Class II bike lanes are provided on both sides of the road. On-street parking is not permitted. The posted speed limit is 45 mph. Muirlands Boulevard is classified as a primary arterial.

Rockfield Boulevard is a north-south roadway, running parallel east of I-5 and providing access to residential and commercial uses. There are two 10- to 13-foot travel lanes in each direction, separated by either a raised median or a two-way left turn lane. Sidewalks are provided on both sides of the road. Class II bike lanes are available between the northerly City limit and Lake Forest Drive, Ridge Route Drive and Cavanaugh Road, and El Toro Road and Los Alisos Boulevard. On-street parking is not permitted. The posted speed limit is 45 mph. Rockfield Boulevard is classified as a commercial street west of Ridge Route Drive and a primary arterial east of Ridge Route Drive.

Ridge Route Drive is an east-west road between Trabuco Road and a terminus point at I-5, providing connectivity to residential and retail uses. There are two 11- to 12-foot travel lanes in each direction, which is reduced to one lane in each direction at the railroad underpass between Muirlands Boulevard and Jeronimo Road. South of Costa Bella Drive, opposing travel lanes are separated by a raised median; north of Costa Bella Drive, opposing travel lanes are either undivided or separated by a two-way left turn lane. Sidewalks are provided on both sides of the street, except at the railroad underpass which only provides a sidewalk on the north side. Class II bike lanes are provided north of Rockfield Boulevard except for a short gap at the railroad crossing. On-street parking is prohibited east of Rockfield Boulevard. The posted speed limit is 40 mph; between Serrano Road and Toledo Way (adjacent to El Toro High School and La Madera Elementary School) the speed limit is 25 mph when children are present. Ridge Route Drive is classified as a secondary arterial.

Glenn Ranch Road is an east-west roadway between Portola Parkway and El Toro Road, providing access to residential neighborhoods and several recreational hiking trails. There are two 11- to 24-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks are provided on both sides of the road west of Saddleback Ranch Road and on the north side of the road east of Saddleback Ranch Road. On-street parking is not permitted, and the posted speed limit is 50 mph. Glenn Ranch Road is classified as a primary arterial.

Rancho Parkway is a north-south roadway between Bake Parkway and Portola Parkway. There are two 12- to 14-foot lanes in each direction, separated by a raised median. Sidewalks are provided on both sides of the road south of Lake Forest drive and on the east side of Rancho Parkway north of Lake Forest Drive. Class II bike lanes are provided in both directions. On-street parking is permitted south of Hermana Circle. The posted speed limit is 45 mph. Rancho Parkway is classified as a commercial street.

Rancho Parkway South is a north-south roadway between Alton Parkway and Bake Parkway; west of Alton Parkway, Rancho Parkway South continues as Towne Centre Drive South. There are two 13- to 14-foot lanes in each direction, separated by a raised median. Sidewalks and Class II bike lanes are provided on both sides of the road. On-street parking is not permitted. The posted speed limit is 40 mph. Rancho Parkway South is classified as a primary arterial.

Commercentre Drive is a north-south roadway connecting Alton Parkway, Bake Parkway, and Dimension Drive and provides access to office/industrial uses and Lake Forest City Hall. There are two 11- to 14-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks are provided on both sides of the street. On-street parking is not permitted. The posted speed limit is 45 mph. Commercentre Drive is classified as a secondary arterial.

Freeways

Freeways are distinguished from other types of roadways in that abutting lands have no right or easement of access to or from their abutting lands or, in some cases, such owners have only limited or restricted right or easement of access. Freeways that travel through or adjacent to Lake Forest provide regional connectivity and access to other local freeways are described below.

I-5 is a north-south freeway connecting the Mexican border to the Canadian border, running through California, Oregon, and Washington. I-5 runs along Lake Forest's southwestern City limit and provides local connections to Los Angeles County, northern and southern Orange County, and San Diego County, as well as connections to I-405, SR-133, and other regional freeways. Access to and from I-5 is possible via on- and off-ramps at El Toro Road, Lake Forest Drive, Bake Parkway, and Alton Parkway. Adjacent to Lake Forest, the freeway has five 12-foot general purpose lanes in each direction; there are two high-occupancy vehicle (HOV) (2+ persons) lanes in each direction north of El Toro Road and one HOV lane in each direction south of El Toro Road. The posted speed limit is 65 mph.

SR-241 is a north-south tolled state highway operated by Transportation Corridor Agencies (TCA) and traveling from Rancho Santa Margarita to its terminus at SR-91 in Anaheim. SR-241 bisects Lake Forest and provides connectivity to other state highways consisting of SR-133, SR-261, and SR-91. Access to and from SR-241 is possible via ramps at Alton Parkway, Lake Forest Drive, and Portola Parkway. Within the city, SR-241 has three 12-foot travel lanes in the northbound direction and two to three travel lanes in the southbound direction. The posted speed limit is 65 mph.

Locations for Improvement

As part of the TIA included as Appendix F of this EIR, operations and capacity analysis of roadway segments and intersections throughout and adjacent to the City were conducted to determine locations that may require improvements to operate at acceptable levels of service by year 2040 based on City of Lake Forest, Caltrans, and any other relevant jurisdictional standards. As land use projects throughout the City are approved and developed, the City should continue to monitor conditions at these locations to determine the appropriate timing and/or level of improvement along these facilities, and implement improvements as required. Improvements are fully detailed in the TIA (Appendix F).

The City should continue monitoring conditions along the following roadway segments to determine if and when lane additions may be necessary:

- Portola Parkway, north of El Toro Road
- Bake Parkway, east of Commercentre Drive
- Bake Parkway, west of Commercentre Drive
- Bake Parkway, west of Trabuco Road
- Bake Parkway, west of Toledo Way
- Lake Forest Drive, east of Trabuco Road
- Lake Forest Drive, west of Rockfield Boulevard

The City should continue monitoring conditions at the following intersections to determine if these improvements (which could be implemented with either restriping or minimal right-of-way acquisition and curb modifications) may be necessary:

- Bake Parkway & Rancho Parkway South: Conversion of the outer southbound left turn lane to a southbound through lane.
- Bake Parkway & Jeronimo Road: Installation of an additional westbound left turn lane.
- Lake Forest Drive & Rockfield Boulevard: Conversion of the northbound right-turn lane to a northbound shared through-right lane.

The City should continue monitoring conditions at the following intersections, where improvements may not be feasible due to jurisdictional and/or right-of-way concerns:

- Portola Parkway & SR-241 Ramps
- Alton Parkway & SR-241 Ramps
- Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota
- Paseo De Valencia & Avenida De La Carlota
- El Toro Road & Bridger Road/I-5 NB Ramps

TRANSIT SERVICE

OCTA provides bus service and shared-ride paratransit service within Lake Forest and throughout Orange County. In addition, transit riders can access Metrolink and Amtrak commuter rail services in nearby Irvine and Mission Viejo. There are also a number of park and ride lots in and adjacent to Lake Forest, most of which provide access to OCTA bus routes. The various public transit services in and around Lake Forest are documented below and shown in Figure 3.14-2.

Orange County Transportation Authority (OCTA)

OCTA provides bus service in Orange County. It connects Lake Forest with several nearby cities (including Santa Ana, Mission Viejo, Irvine, and Laguna Hills) and several regional destinations such as John Wayne Airport and Irvine Station. OCTA also provides paratransit service through its ACCESS Service. This shared-ride paratransit serves areas with ¾ mile of an OCTA fixed route service. The fare is $3.60 per passenger, one-way, and reservations are required.

Bus routes in Lake Forest are illustrated in Figure 3.14-2. Table 3.14-1 presents the route information and average weekday daily ridership for all OCTA routes that serve Lake Forest.

TABLE 3.14-1: OCTA TRANSIT LINES AND RIDERSHIP (FISCAL YEAR 2016)

ROUTE	LAKE FOREST STREETS SERVED	DESTINATIONS SERVED	HOURS OF OPERATION	AVERAGE WEEKDAY DAILY RIDERSHIP (ROUTE)	HEADWAY (MINUTES)	
					PEAK	OFF-PEAK
82	Portola Parkway	Foothill Ranch Towne Center, Saddleback Church Park and Ride, Portola Plaza, Rancho Santa Margarita Towne Center	4:51 AM - 7:58 PM	605	70	70
86	Jeronimo Road	Mission Viejo, Norman Murray Community Center, Serrano Intermediate School, Heroes Park, Irvine Civic Center, Kaiser Permanente, Irvine Spectrum, Irvine Station Area, South Coast Plaza, Orange County Performing Arts Center, John Wayne Airport	5:42 AM - 8:53 PM	653	60	60
89	El Toro Road	Portola Plaza, El Toro High School, Serrano Intermediate School, The Arbor, Saddleback Memorial Medical Center, Laguna Hills Transportation Center, Laguna College of Art & Design, Laguna Beach Bus Station	4:57 AM - 10:15 PM	1,250	30	60
177	Lake Forest Drive	Foothill Ranch Towne Center, Saddleback Memorial Medical Center, and Laguna Hills Transportation Center	5:50 AM - 7:17 PM	350	45	90
206	Bake Parkway	Santa Ana Regional Transportation Center, Irvine Station, Irvine Spectrum, and Foothill Ranch Marketplace and Towne Center	5:44 AM - 5:41 PM	87	30	N/A
480	Bake Parkway	Irvine Station, Irvine Spectrum, and Commercentre	6:07 AM - 5:18 PM	78	25	N/A

SOURCE: KITTELSON & ASSOCIATES, 2019.

Metrolink

Metrolink provides heavy-rail, regional transit service to the counties of Los Angeles, San Bernardino, Orange, Ventura, San Diego, and Riverside. The closest Metrolink station to Lake Forest is the Irvine Station, two miles northwest of Lake Forest. The Irvine Station provides 1,650 parking stalls, and parking is free. The Inland Empire-Orange County and Orange County lines serve the Irvine Station. The Inland Empire-Orange County line connects to Oceanside to the south and to San Bernardino to the North, via a connection in the City of Orange and Anaheim Canyon. The Orange County line also connects to Oceanside to the south, and to downtown Los Angeles to the north, serving several cities in Orange County in between. An average of 1,367 passengers per day board at Irvine Station and an average of 346 passengers per day board at Laguna

Niguel/Mission Viejo Station.[1] Metrolink operates Sunday through Saturday with 15 to 30-minute headways during commute periods and provides service between 4:15 AM and 10:41 PM.

Amtrak

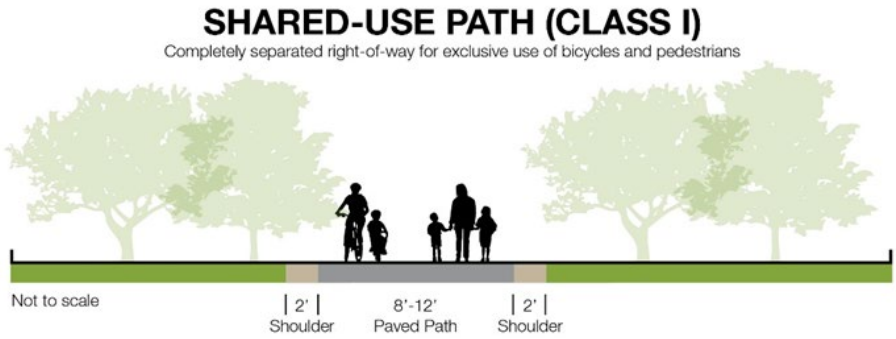
Amtrak operates intercity and interstate rail service nationwide. Currently, there are no Amtrak stops located within the city, but residents can access Amtrak Pacific Surfliner line at the Irvine Station, located in Irvine. The line travels along the California coast, connecting San Luis Obispo to San Diego, and serving destinations such as downtown Los Angeles along the way.

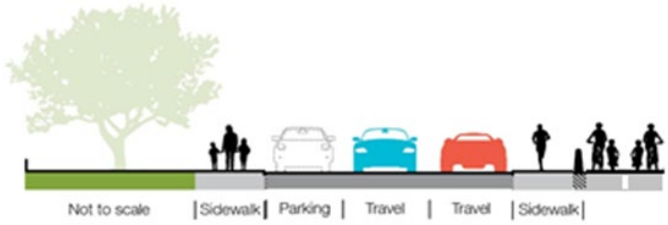
BICYCLE FACILITIES

The City of Lake Forest has a bicycle facilities network that consists of both dedicated and shared street space for bicyclists. Figure 3.14-3 displays the existing designated bicycle facilities in the city.

Bicycle facilities are categorized into four types, as described and depicted in illustrations below. Note that while the graphics include typical widths for the various facilities, the exact configuration of a bike facility can vary depending on its location and the jurisdiction's preferences.

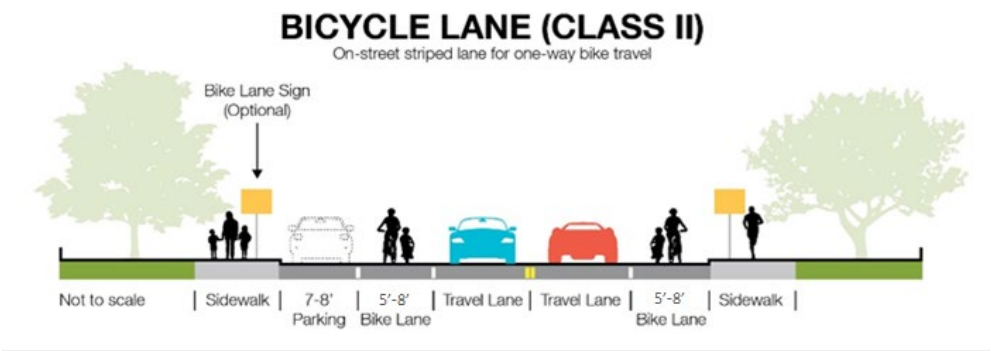
- **Class I Bikeway (Bike Path):** Also known as a shared-use path or multi-use path, a bike path is a paved right-of-way for bicycle travel that is completely separate from any street or highway.



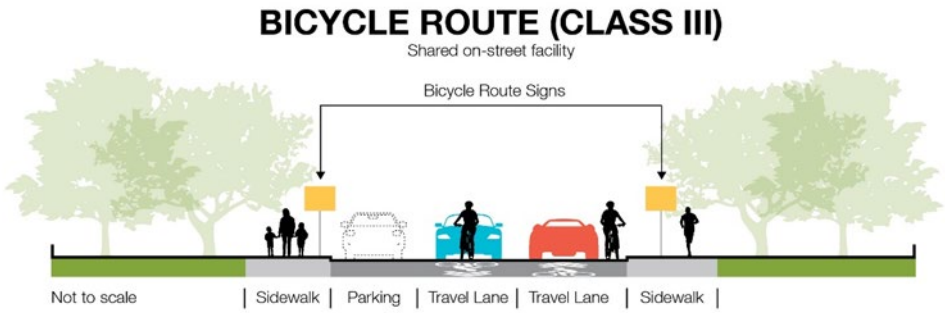


[1] Southern California Regional Rail Authority Development of Strategic Plan, 2016.

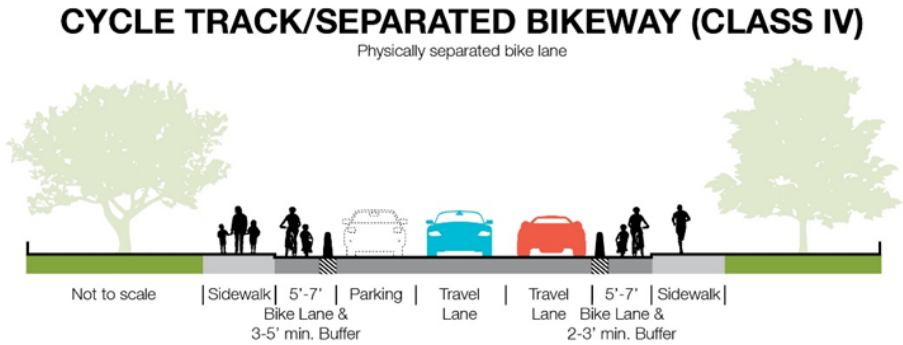
- **Class II Bikeway (Bike Lane):** A striped and stenciled lane for one-way bicycle travel on a street or highway. This facility could include a buffered space between the bike lane and vehicle lane and the bike lane could be adjacent to on-street parking.



- **Class III Bikeway (Bike Route):** A signed route along a street where the bicyclist shares the right-of-way with motor vehicles. This facility can also be designated using a shared-lane marking (sharrow).



- **Class IV Bikeway (Separated Bike Lane):** A bikeway for the exclusive use of bicycles including a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.



As shown in Figure 3.14-3, the existing bicycle facilities in Lake Forest include:

- A Class I facility running along Aliso Creek between Santiago Canyon Road and Laguna Niguel.
- Class II bicycle lanes on the city's arterial roadways including Portola Parkway, Alton Parkway, Bake Parkway, Ridge Route Drive, Trabuco Road, Jeronimo Road, Muirlands Boulevard, Los Alisos Boulevard, and Rancho Parkway.
- Class II bicycle lanes on portions of the city's arterial roadways including Lake Forest Drive (Muirlands Boulevard to Portola Parkway), Toledo Way (Bake Parkway to Lake Forest Drive), and Rockfield Boulevard (Ridge Route Drive to Cavanaugh Road and El Toro Road to Los Alisos Boulevard.
- The Serrano Creek Trail, an unpaved multiuse trail running from Bake Parkway to El Toro Road.
- Several unpaved multiuse trails in the Foothill area, including the Borrego Trail.
- Non-motorized bridges and underpasses along the Aliso Creek bikeway, Serrano Creek Trail, and other paths and trails.

PEDESTRIAN FACILITIES

Lake Forest offers several types of facilities and amenities that support walking in the city. The availability and quality of pedestrian facilities vary throughout the city and can be analyzed using seven key factors as shown in Table 3.14-2.

TABLE 3.14-2: PEDESTRIAN FACILITY CONDITIONS IN LAKE FOREST

FACTOR	*DESCRIPTION*	*ASSESSMENT*
Sidewalk Availability	Sidewalk availability is core to supporting walkability and safety separating pedestrians from vehicles and other modes. In addition, it is important that sidewalks are present on both sides of the roadway and are available along the entire segment rather than end midblock.	Sidewalks are generally provided on both sides of arterial and local streets across the city. A small number of sidewalk coverage gaps exist, including at the Lake Forest Drive overpass at I-5, Ridge Route Drive railroad underpass, Trabuco Road bridge at Aliso Creek, and El Toro Road north of Trabuco Road.
Sidewalk Conditions	Cracked, broken, or otherwise damaged sidewalks can pose a safety hazard and discourage walking.	Sidewalks in the city are in good condition, free of cracks or uplifts.
Crosswalk Availability	Marked crosswalks can accommodate pedestrians that need to cross streets. A lack of marked crosswalks could hinder walkability since pedestrians need to travel greater distances to reach a marked crossing point. Drivers may also be less likely to yield to pedestrians at unmarked crossings.	Marked crosswalks are consistently provided at intersections across the city.
Shading	Shading, whether natural or artificial, can encourage walking in areas such as Southern California which are relatively warm with limited rainfall, especially in the summer.	Shading is provided across the city in the form of abundant tree landscaping along arterials and local residential streets.

FACTOR	DESCRIPTION	ASSESSMENT
Flat Grade	Steep hills and ravines can discourage walking, especially for pedestrians with limited mobility.	While there is a gradual elevation increase in the city heading northeast, the city is generally flat without steep grade changes at the pedestrian level. Locations with noticeable grade increases include the Bake Parkway and El Toro Road railroad overpasses, the Lake Forest Drive bridge at I-5, and Glenn Ranch Road.
Buffer	Buffers which provide separation between pedestrians and moving vehicles can help improve the walking experience, and can include landscaping, parked vehicles, and bulbouts, which serve to both reduce pedestrian crossing distances at intersections and as a traffic calming measure.	Within Lake Forest's residential neighborhoods, buffers consist of grass, other landscaping, and parallel parking. Along arterial roads, parking is generally prohibited, and bike lanes are sometimes present; arterial roads tend not to have street landscaping buffers.
Amenities	In addition to physical facilities that accommodate walking, useful or interesting amenities along sidewalks create a more interesting walking environment and increase pedestrian comfort. Amenities can include sidewalk-adjacent retail and restaurants, landscaping, and street furniture.	Within Lake Forest's residential neighborhoods, the primary amenity is street landscaping. Arterial roads offer few pedestrian-level amenities, especially given that retail in Lake Forest is generally not street-facing.

SOURCE: KITTELSON & ASSOCIATES, INC., 2019.

In addition to on-street facilities, Lake Forest residents enjoy several off-road hiking-only and multiuse trails. These include the Serrano Creek Trail and other trails in the Foothill area, as shown in Figure 3.14-3. In addition, pedestrians using these trails are supported by several bicycle/pedestrian bridges and underpasses across the city.

Freight/Goods Movement

The Surface Transportation Assistance Act (STAA) of 1982 defines a network of state facilities as truck routes which accommodate large trucks. STAA-designated truck routes in Lake Forest consist of I-5 and SR-241. Other STAA-designated truck routes in proximity to Lake Forest include Interstate 405 (I-405), SR-133/Laguna Canyon Road, and SR-73. These truck routes are shown in Figure 3.14-4.

According to the current General Plan, trucks on local roads should be limited to arterial roadways. The City's Municipal Code prohibits vehicles exceeding a maximum gross weight of 14,000 pounds from using the following arterials and local roads in the city, displayed in Figure 3.14-4:[2]

- Canada Road - from Dimension Drive to Lake Forest Drive
- Osterman Road - from Pittsford Drive to Regency Lane
- Pittsford Drive - from Northcrest Drive to Lake Forest Drive
- Regency Lane - from Normandale Drive to Lake Forest Drive

[2] City of Lake Forest Municipal Code, 12.26.030

- Normandale Drive - from El Toro Road to Osterman Road
- Aliso Park Drive - from El Toro Road to Midcrest Drive
- Northcrest Drive - from Midcrest Drive to El Toro Road
- Serrano Road - from Toledo Way to El Toro Road
- Toledo Way - from Bake Parkway to Lake Forest Drive
- Jeronimo Road - from Bake Parkway to Lake Forest Drive
- Muirlands Boulevard - from north City limits to Lake Forest Drive

Additionally, goods movement in Lake Forest and the surrounding area is supported by the Topeka & Santa Fe Railroad which runs through the city between Muirlands Boulevard and Jeronimo Road. This is an important regional freight facility and is included in Southern California Association of Governments' (SCAG's) main line rail network.[3]

Aviation System

John Wayne Airport, located approximately 10 miles northwest of Lake Forest and surrounded by the cities of Irvine, Newport Beach, and Costa Mesa, is a commercial airport serving passenger and cargo airplanes. The airport has two runways and is the third busiest airport in Southern California with over 10 million passengers in 2016. Lake Forest residents can directly access the airport using I-405, which connects to Lake Forest via I-5, SR-133, and SR-241. Other passenger airports in the region include Los Angeles International Airport, Long Beach Airport, Ontario International Airport, Hollywood Burbank Airport, and San Diego International Airport.

3.14.2 REULATORY SETTIN

The General Plan, along with a variety of regional, State, and Federal plans, legislation, and policy directives provide guidelines for the safe operation of streets and transportation facilities in Lake Forest. While the City of Lake Forest has primary responsibility for the maintenance and operation of local transportation facilities in its jurisdiction, Lake Forest staff works on a continual basis with responsible regional, State, and Federal agencies, including SCAG, OCTA, Caltrans, and the Federal Highway Administration (FHWA), as well as others, to maintain, improve, and balance the competing transportation needs of the community and the region.

FEDERAL

Americans With Disabilities Act

The Americans with Disabilities Act (ADA) of 1990 provides comprehensive rights and protections to individuals with disabilities. The goal of the ADA is to assure equality of opportunity, full participation, independent living and economic self-sufficiency. To implement this goal, the United States Access Board has created accessibility guidelines for public rights-of-way. The guidelines address various issues, including roadway design practices, slope and terrain issues, pedestrian access to streets, sidewalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way.

[3] Southern California Association of Governments, 2016-2040 RTP/SCS, June 2016.

The City of Lake Forest is committed to ensure that people with disabilities have access to City programs, services, activities and facilities. In all of its services, programs, events, activities, facilities, and public meetings, the City strives to eliminate any barriers that prohibit people with disabilities from full access to facilities.

Federal Highway Administration

The FHWA is a federal agency that focuses on national highway programs. FHWA administers and manages federal highway programs and establishes national standards. The FHWA publishes the Manual on Uniform Traffic Control Devices (MUTCD) which specifies the standards for street markings, traffic signals, and street signs in the United States. Caltrans developed the California MUTCD based on the FHWA MUTCD.

STATE

Caltrans

Caltrans is the primary state agency responsible for transportation issues. One of its duties is the construction and maintenance of the state highway system. Caltrans has established standards for roadway traffic flow and developed procedures to determine if State-controlled facilities require improvements. For projects that may physically affect facilities or require access to a state highway, Caltrans requires encroachment permits before such activity may be undertaken. For projects that would not physically affect facilities but may influence traffic flow and levels of services at such facilities, Caltrans may recommend measures to mitigate the traffic impacts of such projects.

Additionally, the following Caltrans procedures and directives are relevant to transportation improvements in Lake Forest:

- **Level of Service Target**: Caltrans maintains a target level of service at the transition between LOS C and LOS D for all of its facilities. Where an existing facility is operating at less than the LOS C/D threshold, the existing measure of effectiveness should be maintained.
- **Caltrans Project Development Procedures Manual**: This manual outlines pertinent statutory requirements, planning policies, and implementing procedures regarding transportation facilities. It is continually and incrementally updated to reflect changes in policy and procedures. For example, the most recent revision incorporates the Complete Streets policy from Deputy Directive 64-R1, which is detailed below.
- **Caltrans Deputy Directive 64 (2001)**: This directive requires Caltrans to consider the needs of non-motorized travelers, including pedestrians, bicyclists, and persons with disabilities, in all programming, planning, maintenance, construction, operations, and project development activities and products. This includes incorporation of the best available standards in all of the Department's practices.
- **Caltrans Deputy Directive 64-R1 (2014)**: This directive requires Caltrans to provide for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the state highway system. Caltrans supports bicycle, pedestrian, and transit travel with a focus on "complete streets" that begins early in system planning and continues through project construction and maintenance and operations.

- **Caltrans Director's Policy 22 (2001)**: This policy establishes support for balancing transportation needs with community goals. Caltrans seeks to involve and integrate community goals in the planning, design, construction, and maintenance and operations processes, including accommodating the needs of bicyclists and pedestrians.
- **Environmental Assessment Review and Comment**: Caltrans, as a responsible agency under CEQA, is available for early consultation on a project to provide guidance on applicable transportation analysis methodologies or other transportation related issues and is responsible for reviewing the traffic impact study for errors and omissions pertaining to the state highway facilities. Caltrans published the Guide for the Preparation of Traffic Impact Studies (December 2002), which established the Measures of Effectiveness as described under "Level of Service Target" above. The Measures of Effectiveness is used to determine significant impact on state facilities. The Guide also mandates that the traffic analysis includes mitigation measures to lessen the potential project impacts on state facilities and the project's fair share responsibility for the impacts. However, the ultimate mitigation measures and their implementations are to be determined upon consultation between Caltrans, the City and the project proponent.

OPR General Plan Guidelines

The Governor's Office of Planning and Research (OPR) publishes General Plan Guidelines as a "how to" for cities and counties developing their general plans. OPR released its updated guidelines in 2017, which includes legislative changes, new guidance, policy recommendations, external links to resource documents, and additional resources. For each general plan element, the guidelines discuss statutory requirements in detail, provide recommended policy language, and include examples of city and county general plans that have adopted similar policies.

Assembly Bill 32, Senate Bill 32 and Senate Bill 375

Assembly Bill (AB) 32, also known as the Global Warming Solutions Act of 2006, committed California to reducing greenhouse gas (GHG) emissions to 1990 levels by 2020. The California Air Resources Board (ARB), which is coordinating the response to comply with AB 32, is currently on schedule to meet this deadline. In 2016, Senate Bill (SB) 32 added a new target: reducing statewide emissions to 40 percent below 1990 levels by 2030.

SB 375 provides guidance for curbing emissions from cars and light trucks to help California comply with AB 32. There are five major components to SB 375:

- ARB will guide the adoption of GHG emission targets to be met by each Metropolitan Planning Organization (MPO) in the state.
- MPOs are required to create a Sustainable Communities Strategy (SCS) that provides a plan for meeting these regional targets. The SCS must be consistent with the Regional Transportation Plan (RTP).
- Regional housing elements and transportation plans must be synchronized on eight-year schedules. Also, the SCS and Regional Housing Needs Assessment (RHNA) must be consistent with each other.
- CEQA is streamlined for preferred development types such as mixed-use projects and transit-oriented developments (TODs) if they meet specific requirements.
- MPOs must use transportation and air emission modeling methodologies consistent with California Transportation Commission (CTC) guidelines.

California Complete Streets Act

Originally passed in 2008, California's Complete Streets Act took effect in 2011 and requires local jurisdictions to plan for land use transportation policies that reflect a "complete streets" approach to mobility. "Complete streets" comprises a suite of policies and street design guidelines which provide for the needs of all road users, including pedestrians, bicyclists, transit operators and riders, children, the elderly, and the disabled. From 2011 onward, any local jurisdiction—county or city—that undertakes a substantive update of the circulation element of its general plan must consider "complete streets" and incorporate corresponding policies and programs. In 2010, OPR released guidelines for compliance with this legislation which provide direction on how circulation elements can best plan for a variety of travel modes such as transit, walking, bicycling, and freight.

Senate Bill 743

On September 27, 2013, SB 743 was signed into law.[4] The Legislature found that with the adoption of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the State had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled (VMT) and thereby contribute to the reduction of GHG, as required by the California Global Warming Solutions Act of 2006 (AB 32). Additionally, the Complete Streets Act (AB 1358), requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users. To further the State's commitment to the goals of SB 375, AB 32 and AB 1358, SB 743 adds Chapter 2.7, Modernization of Transportation Analysis for Transit-Oriented Infill Projects, to Division 13 (Section 21099) of the Public Resources Code.

SB 743 started a process that could fundamentally change transportation impact analysis as part of CEQA compliance. These changes will include the elimination of auto delay, LOS, and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts in many parts of California (if not statewide). Further, parking impacts will not be considered significant impacts on the environment for select development projects within infill areas with nearby frequent transit service. SB 743 includes amendments that revises the definition of "in-fill opportunity zones" to allow cities and counties to opt out of traditional LOS standards established by congestion management programs (CMPs) and requires OPR to update the CEQA Guidelines and establish "criteria for determining the significance of transportation impacts of projects within transit priority areas.[5] As part of the new CEQA Guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation

[4] An act to amend Sections 65088.1 and 65088.4 of the Government Code, and to amend Sections 21181, 21183, 21186, 21187, 21189.1, and 21189.3 of, to add Section 21155.4 to, to add Chapter 2.7 (commencing with Section 21099) to Division 13 of, to add and repeal Section 21168.6.6 of, and to repeal and add Section 21185 of, the Public Resources Code, relating to environmental quality.

[5] A "transit priority area" is defined in as an area within one-half mile of an existing or planned major transit stop. A "major transit stop" is defined in Public Resources Code Section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

networks, and a diversity of land uses." OPR presented alternative metrics in a preliminary discussion draft in summer of 2014 and released a final advisory in December 2018. Key guidance includes:

- VMT is the most appropriate metric to evaluate a project's transportation impact.
- OPR recommends tour- and trip-based travel models to estimate VMT, but ultimately defers to local agencies to determine the appropriate tools.
- OPR recommends measuring VMT for residential and office projects on a "per rate" basis. Specifically, OPR recommends VMT per capita for residential projects and VMT per employee for office projects.
- OPR's recommended impact threshold for residential and office projects is VMT per capita fifteen percent below the city or regional average (whichever is applied). In other words, an office project that generates VMT per employee that is more than 85 percent of the regional VMT per employee could result in a significant impact. This threshold is in line with statewide greenhouse gas emission reduction targets.
- For retail projects, OPR recommends measuring the net decrease or increase in VMT in the study area with and without the project. The recommended impact threshold is any increase in total VMT.
- Lead agencies ultimately have the discretion to set or apply their own significance thresholds, provided they are based on significant evidence.
- Cities and counties still have the ability to use metrics such as LOS for other plans, studies, or network monitoring. However, LOS and similar metrics cannot constitute the sole basis for CEQA impacts.

SB 743-compliant CEQA analysis will become mandatory on July 1, 2020.

Assembly Bill 417

In October 2013, AB 417 created a statutory CEQA exemption for bicycle plans in urbanized areas. Before the passage of this bill, cities and counties that prepared bicycle plans were required to carry out a CEQA review. AB 417 exempts the following types of bicycle projects in an urbanized area:

- Restriping of streets and highways;
- Bicycle parking and storage;
- Signal timing to improve intersection operations;
- Signage for bicycles, pedestrians, and vehicles.

However, not all bicycle plans are exempt if certain conditions are met (e.g., a new Class I bicycle trail through a sensitive natural area).

REGIONAL

Southern California Association of Governments (SCAG)

SCAG is a federally designated MPO and is made up of six counties and 191 cities. SCAG develops long-range regional transportation plans including sustainable communities strategies and growth forecast components, regional transportation improvement programs, regional housing needs allocations, and a portion of the South Coast Air Quality Management Plans. SCAG approved its most-recent Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) in April 2016, which outlines the long-range vision and the region's transportation system investments through 2040.

Orange County Transportation Authority (OCTA)

The Orange County Transportation Authority (OCTA) coordinates transportation planning efforts throughout Orange County and programs funding for project implementation. Additionally, it prepares the CMP, a plan mandated by California law to describe the strategies to address congestion problems on the CMP network, which includes State highways and principal arterials. The CMP Guidelines require analysis of the CMP network and uses level of service standards as a means to measure congestion and to determine how local governments meet CMP standards. OCTA also administers the MPAH, which was established in 1956 to ensure that the county's regional highway network would be planned, developed, and preserved in order to supplement the freeway system. The MPAH defines the intended functions and carrying capacities of regional roads in the county. In order to be eligible for Measure M2 funding, a city's General Plan Circulation Element must be consistent with the MPAH; specifically, local circulation elements must maintain an equivalent number of minimum through lanes on each arterial highway that is included as part of the MPAH.

OCTA's Long Range Transportation Plan (LRTP) is a long-range policy document that assesses the county's transportation system over a 20-year horizon and identifies the projects that best address future population, housing, and employment needs. The most recent LRTP was finalized in September 2014 and outlines a vision of multimodal transportation improvements in the county to meet expected demand through 2035, including expanding system choices, improving performance, improving multimodal integration, and ensuring financial sustainability. The 2014 – 2019 OCTA Strategic Plan aims to address the county's short-term (five year) transportation needs and facilitates ongoing planning and implementation within OCTA. The Strategic Plan also sets out OCTA's principals and goals for guiding decision-making and planning.

OCTA also provides bus transit and paratransit services within Orange County, as well as to Los Angeles and Riverside. The OC Transit Vision, published in January 2018, is OCTA's transit-specific master plan that aims to improve transit service for the next 20 years. The plan looks at long-term transit needs, including bus, rail, paratransit, and new types of transportation services and technologies. The plan also identifies the corridors within the county with the highest expected demand and assesses which modes would be appropriate to meet that demand, such as streetcars, bus rapid transit (BRT), or other emerging modes.

OC Active, initiated in March 2017 and currently ongoing, is OCTA's Bike and Pedestrian Plan. The plan's primary goal is to recognize the areas and opportunities for active transportation across the county. The OC Active goals include advancing the strategic walking and biking network, enhancing walking and biking access to transit, improving high-need pedestrian areas, reducing pedestrian and bicyclist collisions, and leveraging funding opportunities for active transportation projects.

Orange County Council of Governments (OCCOG)

The Orange County Council of Governments (OCCOG) is a voluntary joint-powers agency that is Orange County's sub-regional planning organization and serves as a channel for local jurisdictions to engage cooperatively on matters such as land use, energy, mobility, air quality, and water. OCCOG's first three-year Strategic Plan, published in May 2016, outlines goals for the organization through 2019 including county advocacy at the regional level. OCCOG also recently completed its Complete Streets Initiative Design Handbook and Funding Toolkit, which aims to help local jurisdictions comply with state Complete Streets legislation, helps guide policy development, and provides design guidance for implementing Complete Streets principles in communities.

Foothill Circulation Phasing Plan

Adopted in September 1987, the Foothill Circulation Phasing Plan (FCPP) provides for roadway construction and improvements in the Foothill area to accommodate new development. Cities in the Foothill area that are subject to the FCPP, including Lake Forest, collect FCPP fees at the time building permits are issued. Roadway construction and improvements are financed and constructed to correspond with development in the Foothill area.

Foothill and Eastern Transportation Corridor Fee Program

TCAs operate the publicly-owned toll facilities in Orange County: SR-73, SR-133, SR-241, and SR-261. These roads were financed with bonds which are backed by toll revenues and development impact fees. Development impact fees are assessed on new construction in areas that benefit from these four toll facilities. Lake Forest falls within two fee zones: Foothill/Eastern (F/E) Zone A (north of Trabuco Road) and F/E Zone B (south of Trabuco Road), which run parallel to SR-241 and I-5, respectively. Fees are assessed on a per-unit basis for residential development and on a per square footage basis for non-residential square footage and are collected when a building permit is issued.

Metrolink

Metrolink is a regional transportation agency providing passenger rail service to Los Angeles, Ventura, Riverside, San Bernardino, Orange, and San Diego[6] Counties. Metrolink's 10-year Strategic Plan and 5-Year Short Range Transit Plan were approved by the Metrolink Board of Directors in March 2016. These plans are policy documents that guide transportation funding decisions and establishes goals for the agency in the upcoming years. Metrolink does not provide a station in the City of Lake Forest, but Lake Forest residents can access Metrolink trains at the Irvine and Laguna Niguel/Mission Viejo stations. These stations provide directions to downtown Los Angeles, San Bernardino, and Oceanside.

LOCAL

Lake Forest Transportation Mitigation Program

The Lake Forest Transportation Mitigation Program (LFTM) was established to provide funding for the coordination and phased installation of transportation improvements in the city to mitigate the impacts of specific projects within the city. Fees are based on typical trip lengths and average daily trips for each type of land use. The City conducts a review of LFTM every five years. These updates assess whether any LFTM improvements should be reduced or eliminated and whether improvement costs should be updated or reallocated between projects; no new improvements are added to LFTM during these reviews. The City assesses mitigation needs and allocates fees using the Lake Forest Traffic Analysis Model (LFTAM), which was developed based on the Orange County Transportation Analysis Model (OCTAM), the subregional model developed by OCTA and based on the SCAG regional travel demand model.

[6] Metrolink Inland Empire-Orange County Line and Orange County Line service extend to one station in San Diego County (Oceanside).

Lake Forest Capital Improvement Plan

The City of Lake Forest Capital Improvement Plan (CIP) is a list of projects programmed for funding from identified funding sources for a three-year period. The most recent (2019-2021) CIP includes projects designed to improve safety, traffic flow, median and parkway landscaping, and maintain the roadway network. Transportation-related improvements in the current CIP include:

- Sidewalk repairs;
- ADA ramps;
- Roadway widening and turn lanes at intersections;
- Traffic signal improvements;
- Pavement resurfacing.

3.14.3 IMPACTS AND MITIGATION MEASURES

METHODS OF ANALYSIS

The TIA assesses how the study area's transportation system would operate with the implementation of the City of Lake Forest General Plan Update. The General Plan Update Mobility Element's circulation map is shown in Figure 3.14-5. The potential impacts were identified based on a set of significance criteria based on the CEQA Guidelines.

General Plan Traffic

The proposed General Plan could result in significant infill development in the city with a mix of uses, as noted below. It is noted that the proposed land uses represent the full citywide buildout and include existing development in the city.

- 29,167 single family residential units;
- 22,167 multi-family residential units;
- Approximately 5,567,524 square feet of office uses;
- Approximately 9,733,234 square feet of retail uses;
- Approximately 12,425,826 square feet of other non-residential uses

In total, the General Plan would result in a buildout of approximately 51,334 housing units, 152,462 residents, 27,726,585 non-residential square feet, and 52,241 employees within the City's boundaries.

Weekday daily, AM peak hour, and PM peak hour volume forecasts for the General Plan were developed using the OCTAM and LFTAM travel demand models. Trip generation specific to the General Plan can be derived from LFTAM, which computes weekday daily, weekday AM and weekday PM peak hour trips. Under Cumulative Plus Plan conditions, the plan area would generate approximately 830,313 daily trips on a typical weekday.

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with transportation and circulation if it will:

- Increase VMT per person above No Project conditions;
- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; and/or
- Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

VMT Thresholds

As part of the new CEQA Guidelines updated for SB 743, the new criteria to replace LOS "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses," per Public Resources Code section 21099. OPR released a final advisory in December 2018, which provided guidance for implementing VMT analysis as the most appropriate metric to evaluate a project's transportation impact. Therefore, the TIA assesses VMT (as opposed to LOS) to be consistent with requirements that will become mandatory on July 1, 2020.

The City of Lake Forest has not yet adopted guidelines on the appropriate metrics and thresholds of significance for SB 743-consistent VMT analysis. Therefore, this study assesses the changes in VMT per person between Cumulative (2040) No Project (Previous General Plan) and Cumulative (2040) Plus Plan (Proposed General Plan Update) to determine if the Plan would result in an increase in VMT per person in the city. Given that the Proposed General Plan Update consists of a land use and mobility plan with proposed changes at the citywide level, a threshold of no increase from the previous plan is appropriate to consider the effect of the plan on the environment. In particular, the Proposed General Plan update includes increases in residential, office, retail, and other land uses within the city. A threshold of no increase in VMT per capita and VMT per employee from the Previous General Plan indicates that the Proposed General Plan would maintain travel characteristics within the city and not result in longer travel distances.

Consistent with OPR guidance, LFTAM was utilized to estimate the following metrics for comparison purposes:

- Residential VMT per person (Home-based trip VMT per resident in the city)
- Commuter VMT per person (Work-based trip VMT per employee in the city)

CMP Operations Thresholds

Under Cumulative (2040) Plus Plan conditions, CMP intersections were analyzed to fulfill OCTA CMP requirements. Given that OCTA has not adopted VMT analysis methodologies and thresholds at this time, this CMP analysis examines intersection LOS. CMP intersections are analyzed using the Intersection Capacity Utilization (ICU) methodology (Table 3.14-3). The following intersections are CMP-designated intersections according to the Orange County CMP and to be analyzed under CMP standards:

- #17 – El Toro Road & Trabuco Road
- #38 – El Toro Road & Bridger Road/I-5 NB Ramps
- #39 – El Toro Road & Avenida De La Carlota (in Laguna Hills)

The maximum acceptable level of service under this analysis is LOS E. For these intersections, the impact would be considered significant if:

- Plan traffic would cause the LOS at an intersection to degrade from LOS E or better to LOS F, or
- Project traffic would increase the volume-to-capacity (V/C) ratio by more than 0.10 at an intersection operating LOS F under no project conditions.

TABLE 3.14-3: INTERSECTION LOS AND V/C RATIOS (ICU METHODOLOGY)

LOS	*V/C RATIO*
A	Less than 0.61
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	Greater than 1.00

SOURCE: KITTELSON & ASSOCIATES., 2019.

IMPACTS AND MITIGATION MEASURES

Impact 3.14-1: General Plan implementation would not increase VMT per person above No Project conditions (Less than Significant)

The residential and commuter VMT under the Previous General Plan and the Proposed General Plan Update for the city of Lake Forest are shown in Table 3.14-4. As shown in the table, the General Plan Update is not expected to increase VMT per person above No Project/Previous General Plan conditions. In fact, home-based VMT per resident is expected to decrease by 4% and work-based VMT per employee is expected to decrease by approximately 6% under the Proposed General Plan Update. Part of this reduction could be attributed to the increasing amounts of residential and employment opportunities within the city with the Proposed General Plan Update. For example, the increase of office, retail, and other uses within the City would decrease the need for Lake Forest

residents to travel long distances inside and outside the City for their employment or other needs, resulting in shorter vehicular travel distances per capita. In addition, the increased amount of residential uses within would help serve the current and future employment base and thus reduce the amount of inter-city commuting required.

TABLE 3.14-4: CUMULATIVE (2040) VMT COMPARISON

STATISTIC	*PREVIOUS GENERAL PLAN*	*PROPOSED GENERAL PLAN UPDATE*	*CHANGE IN VMT PER RESIDENT/EMPLOYEE*
HOME-BASED VMT			
Home-Based Trip VMT	1,966,070	2,531,888	- 4.2%
Total Residents	102,567	137,776	
Home-Based VMT per Resident	*19.2*	*18.4*	
WORK-BASED VMT			
Work-Based Trip VMT	1,413,984	1,425,619	- 6.2%
Total Employees	62,193	66,775	
Work-Based VMT per Employee	*22.7*	*21.3*	

SOURCE: STANTEC, INC., 2019.

As shown in Table 3.14-4, the Proposed General Plan update is not expected to increase VMT per person above No Project conditions. Therefore, the VMT-related impacts of the Plan would be considered **less than significant**.

While no mitigation measures are necessary, the General Plan includes two policies designed to ensure a VMT threshold is established and Transportation Demand Management (TDM) measures are provided. See Policies M-8.1 and M-8.2 below.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

Policy M-8.1: VMT Thresholds. Establish vehicle miles traveled (VMT) thresholds and Transportation Demand Management (TDM) mitigation requirements for the purposes of environmental review under the California Environmental Quality Act (CEQA). The City shall continue to maintain LOS standards for the purposes of planning and designing street improvements.

Policy M-8.2: Existing Transportation Demand Management Efforts. Continue to support the implementation of existing regional efforts such as the employer TDM provisions of the Air Quality Management Plan (AQMP) and the Congestion Management Program (CMP).

Impact 3.14-2: General Plan implementation would not conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways (Less than Significant)

Orange County CMP intersections were analyzed to identify potential impacts of the Plan on the CMP system. The LOS and v/c for the three CMP intersections in the study area are shown in Table 3.14-5.

TABLE 3.14-5: CUMULATIVE (2040) PLUS PLAN INTERSECTION LEVEL OF SERVICE (CMP INTERSECTIONS)

INTERSECTION		*PEAK HOUR*	*EXISTING*		*2040 PLUS PLAN*		*CHANGE*
			V/C	*LOS*	*V/C*	*LOS*	
17	El Toro Road & Trabuco Road	AM	0.62	B	0.68	B	0.06
		PM	0.60	A	0.69	B	0.09
38	El Toro Road & Bridger Road/I-5 NB Ramps	AM	0.63	B	0.78	C	0.15
		PM	0.66	B	0.96	E	0.30
39	El Toro Road & Avenida De La Carlota	AM	0.37	A	0.47	A	0.10
		PM	0.56	A	0.78	C	0.22

SOURCE: KITTELSON & ASSOCIATES, INC., 2019

As shown in Table 3.14-5, the CMP intersections are expected to operate acceptably (LOS E or better) under Cumulative (2040) Plus Project conditions. Therefore, the impacts of the Plan to CMP facilities would be considered **less than significant**.

While no mitigation measures are necessary, the General Plan includes a set of policies designed to ensure acceptable travel conditions on regional and local roads.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

Policy M-1.1: Master Plan of Arterial Highways (MPAH). Coordinate with OCTA with respect to regional vehicular access as documented in the OCTA MPAH.

Policy M-1.2: New Development. Work with developers to minimize the effects of new development on the local and regional transportation system, and require developers to contribute fair share payments or make improvements in order to maintain the LOS standards established under Policy M-2.1.

Policy M-1.3: Traffic Diversion. Explore discouraging non-local traffic through neighborhoods and diverting traffic to arterial roadways using tools such as traffic control devices, restrictions, speed limits, and other strategies.

Policy M-1.4: Adjacent Jurisdictions. Work with adjacent jurisdictions and agencies to ensure that there is cross-jurisdictional consistency in transportation facilities.

Policy M-1.5: OCTA CMP. Continue to participate in the OCTA Congestion Management Program (CMP)'s regional planning and continue to require analysis of traffic impacts on relevant facilities in accordance with CMP standards.

Policy M-1.6: Freeway Coordination. Coordinate with Caltrans and Transportation Corridor Agencies (TCA) on matters such as:

- *Reducing the effects of I-5 and SR-241 ramp operations on City streets*
- *Participating in discussions pertaining to ramp improvements currently being studied and any future improvements in the vicinity of Lake Forest*
- *Encouraging freeway improvements that would ease local congestion*

Policy M-1.7: Regional Agency Coordination. Coordinate with regional agencies such as OCTA, County of Orange, Metrolink, Caltrans, and TCA to meet the needs of people living in, working in, or visiting Lake Forest.

Impact 3.14-3: General Plan implementation would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks (No Impact)

As noted previously, John Wayne Airport is located approximately 10 miles northwest of Lake Forest. The nature of the General Plan as a local plan for residential and commercial development (including mixed-used development) within the City of Lake Forest is such that it would not result in a change in air traffic patterns. Lake Forest itself has no existing or planned airport facilities, and potential development within the Planning Area would have no effect on the John Wayne Airport approach or departure zones. Development attributable to the General Plan would be expected to have **no impact** to air traffic.

Impact 3.14-4: General Plan implementation would not substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (Less than Significant)

Lake Forest maintains improvement standards that guide the construction of new transportation facilities to minimize design hazards for all users of the system. Through the environmental review process, land use proposals that would add traffic to streets not designed to current standards are carefully evaluated. If needed, mitigation measures are identified and the project is conditioned to construct or provide funding for an improvement that would minimize or eliminate the hazard. Typical improvements include shoulder widening, adding turn pockets, adding sidewalks or crosswalks, realigning sharp curves, prohibiting certain turning movements, and signalizing intersections, among other options. New and upgraded roadways needed to accommodate new development will be designed according to applicable Federal, State, and local design standards.

The types of uses included within the city of Lake Forest as part of the Plan are generally similar to existing and surrounding uses and thereby are compatible with the existing uses in the Plan area and in the surrounding area. Development and infrastructure projects in Lake Forest would be required to comply with the General Plan, Municipal Code, and applicable State and local regulations. In addition, the Mobility Element developed as part of the General Plan Update contains policies in support of roadway network safety and reducing design hazards. These applicable policies are listed below. Further, the General Plan does not contain any provisions that would increase hazards due to design features of incompatible uses. Therefore, this impact is **less than significant**.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

Policy M-1.3: Traffic Diversion. Explore discouraging non-local traffic through neighborhoods and diverting traffic to arterial roadways using tools such as traffic control devices, restrictions, speed limits, and other strategies.

Policy M-3.1: Transportation Improvements for All Users. Strive to apply Complete Streets principles to new roadways and to new transportation improvements on City facilities to serve all types of travel (including pedestrians, bicyclists, motorists, public transportation, and goods movement) and all abilities.

Policy M-3.2: Eliminating Gaps. Continue to identify and address gaps in networks serving automobiles, bicyclists, pedestrians, transit users, equestrians, and other users. Remove man-made barriers to accessibility and connectivity.

Policy M-3.3: ADA Accessibility. Ensure the City's transportation network is safe, accessible, and consistent with the Americans with Disabilities Act (ADA), to allow impaired users, such as disabled persons and seniors, to safely travel within and beyond the city.

Policy M-3.4: Safe Routes to School. Work with the Saddleback Valley Unified School District and other schools in the City to establish a Safe Routes to School Program, encouraging parents and children to walk or bike to schools within the city.

Policy M-3.5: Context Sensitivity. Consider the land use and design context of the surrounding areas when designing Complete Streets.

Policy M-5.2: Pedestrian Access Between Uses. Improve pedestrian access between complementary uses such as residential and commercial areas.

Policy M-5.4: Effective Roadway Projects. Consider the implementation of active transportation improvements (such as high visibility crosswalks) when roadways are undergoing rehabilitation, resurfacing, or other modifications.

Policy M-6.1: Speeds on Residential Streets. Explore innovative ways to reduce vehicular speeds through residential neighborhoods to posted speed limits, such as implementing traffic calming strategies.

Policy M-6.2: Speeds on Arterial Roadways. Encourage programming and design strategies to maintain safe vehicular speeds on its arterial roadways.

Policy M-6.3: Site Designs and Safety. Ensure that development projects follow best design practices to reduce conflicts between multiple travel modes.

Policy M-6.4: Bicyclist and Pedestrian Safety. Develop safe and convenient bicycle and pedestrian facilities and crossings at key intersections and other locations.

Policy M-6.5: Freeway Ramp Safety. Encourage Caltrans and the Transportation Corridor Agencies (TCA) to provide safe pedestrian crossings and other facilities at freeway ramps in Lake Forest.

Policy M-9.2: Roadway Design. Maintain roadway design standards along City arterials to facilitate truck access to light industrial, manufacturing, commercial, and mixed-use areas along designated truck routes.

Impact 3.14-5: General Plan implementation would not result in inadequate emergency access (Less than Significant)

Implementation of the proposed General Plan would result in increased development which would result in new roadways and would increase the number of users on the city's transportation system. There will be a need to ensure that adequate emergency access provisions are made to accommodate increased population and growth.

It is noted that the Plan is a programmatic-level document, and emergency accessibility is typically assessed at the project-level. Adequacy of emergency access associated with future development projects would be analyzed and evaluated in detail through the environmental review process. Additionally, the Mobility Element developed as part of the General Plan update contains policies in support of emergency access along local roads. These applicable policies are listed below. As a result, the General Plan's impacts to emergency circulation and access are considered to be **less than significant**.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

Policy M-1.2: New Development. Work with developers to minimize the effects of new development on the local and regional transportation system.

Policy M-1.6: Freeway Coordination. Coordinate with Caltrans and Transportation Corridor Agencies (TCA) on matters such as:

- *Reducing the effects of I-5 and SR-241 ramp operations on City streets*
- *Participating in discussions pertaining to ramp improvements currently being studied and any future improvements in the vicinity of Lake Forest*
- *Encouraging freeway improvements that would ease local congestion*

Policy M-2.2: Intersection Capacity. Monitor capacity at key intersections in the City.

Policy M-2.3: Monitoring and Implementing Improvements. Monitor roadway operations and ensure that LFTM and other appropriate improvements are implemented in a timely manner.

Policy M-2.4: Transportation System Efficiency. Continue to maximize transportation network efficiency and minimize delay and congestion by investing in Traffic System Management (TSM) and signal maintenance and coordination.

Impact 3.14-6: General Plan implementation would not conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities (Less than Significant)

Implementation of the General Plan could lead to increases in the city's population and employment that would increase the demand for transit services offered by OCTA, Metrolink, and Amtrak. While there are no established standards regarding transit levels of service that have been adopted by the City or transit agencies, the General Plan includes policies that support transit-oriented development patterns, strengthen ties between the pedestrian and bicycle networks to transit, promote enhancements to transit facilities, and support increased transit coverage and frequencies in Lake Forest.

Additionally, implementation of the General Plan would improve the existing bicycle and pedestrian circulation infrastructure and require future development to provide multimodal circulation improvements. Increases in the city's population and employment that could result under implementation of the General Plan would also likely lead to increases in pedestrian and bicycle travel beyond current levels.

The Mobility Element developed as part of the General Plan Update contains several policies that support access to and the performance of transit, bicycle, and pedestrian facilities. These applicable policies are listed below. Further, the Plan includes mixed-use development that is supportive of non-automotive modes.

Overall, the impact of the Plan with respect to access to and performance of transit, bicycle, and pedestrian impacts would be considered **less than significant**.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

Policy M-3.1: Transportation Improvements for All Users. Strive to apply Complete Streets principles to new roadways and to new transportation improvements on City facilities to serve all types of travel (including pedestrians, bicyclists, motorists, public transportation, and goods movement) and all abilities.

Policy M-3.2: Eliminating Gaps. Continue to identify and address gaps in networks serving automobiles, bicyclists, pedestrians, transit users, equestrians, and other users. Remove man-made barriers to accessibility and connectivity.

Policy M-3.3: ADA Accessibility. Ensure the City's transportation network is safe, accessible, and consistent with the Americans with Disabilities Act (ADA), to allow impaired users, such as disabled persons and seniors, to safely travel within and beyond the city.

Policy M-3.4: Safe Routes to School. Work with the Saddleback Valley Unified School District and other schools in the City to establish a Safe Routes to School Program, encouraging parents and children to walk or bike to schools within the city.

Policy M-4.1: Public Transit Use. Support programs encouraging public transit use by people living in, working in, or visiting Lake Forest.

Policy M-4.2: New Transit Facilities. Promote the provision of public transit and supportive transit facilities within areas of major development.

Policy M-4.3: Improve Local Public Transit Service and Stops. Work with OCTA to improve local transit service in the City and bus stop amenities along roads that have local transit service.

Policy M-4.4: Paratransit Service. Continue to support OCTA ACCESS paratransit and other special transit services in Lake Forest.

Policy M-4.5: Regional Transit Connectivity. Encourage OCTA to provide access and public transit service between Lake Forest and the Irvine Transportation Center and other regional-serving transportation centers.

Policy M-4.6: Metrolink Service. Monitor and participate in discussions pertaining to Metrolink service to encourage a level of service that meets Lake Forest's needs.

Policy M-5.2: Pedestrian Access Between Uses. Improve pedestrian access between complementary uses such as residential and commercial areas.

Policy M-5.4: Effective Roadway Projects. Consider the implementation of active transportation improvements (such as high visibility crosswalks) when roadways are undergoing rehabilitation, resurfacing, or other modifications.

Policy M-5.5: Coordination with Adjacent Jurisdictions. Coordinate with adjacent jurisdictions to ensure connected and consistent non-vehicular facilities.

Policy M-6.3: Site Designs and Safety. Ensure that development projects follow best design practices to reduce conflicts between multiple travel modes.

Policy M-6.4: Bicyclist and Pedestrian Safety. Develop safe and convenient bicycle and pedestrian facilities and crossings at key intersections and other locations.

Policy M-6.5: Freeway Ramp Safety. Encourage Caltrans and the Transportation Corridor Agencies (TCA) to provide safe pedestrian crossings and other facilities at freeway ramps in Lake Forest.

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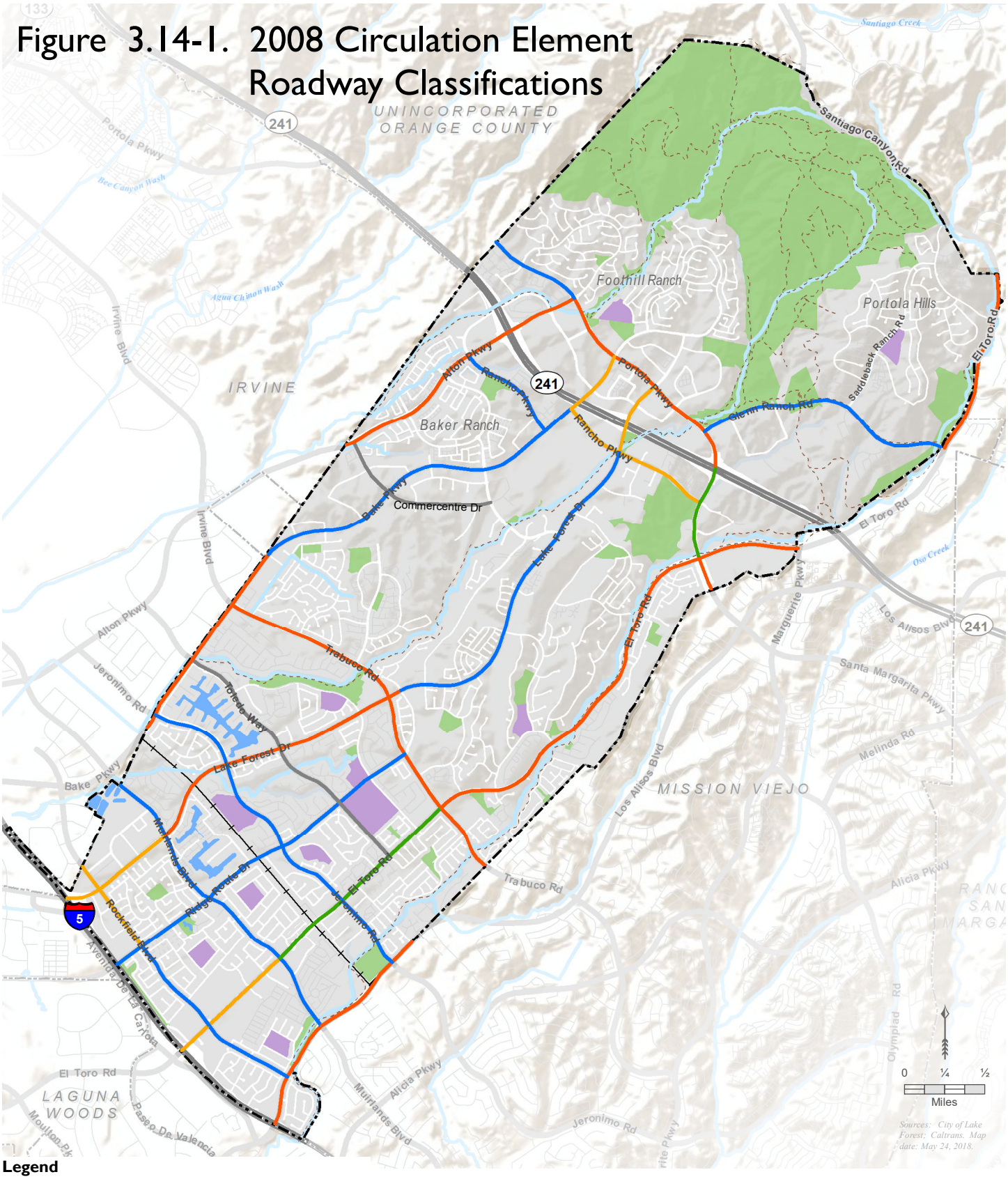
Figure 3.14-1. 2008 Circulation Element Roadway Classifications



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails

Roadway Classifications

- Principal Arterial
- Major Arterial
- Primary Arterial
- Secondary Arterial
- Commercial Street

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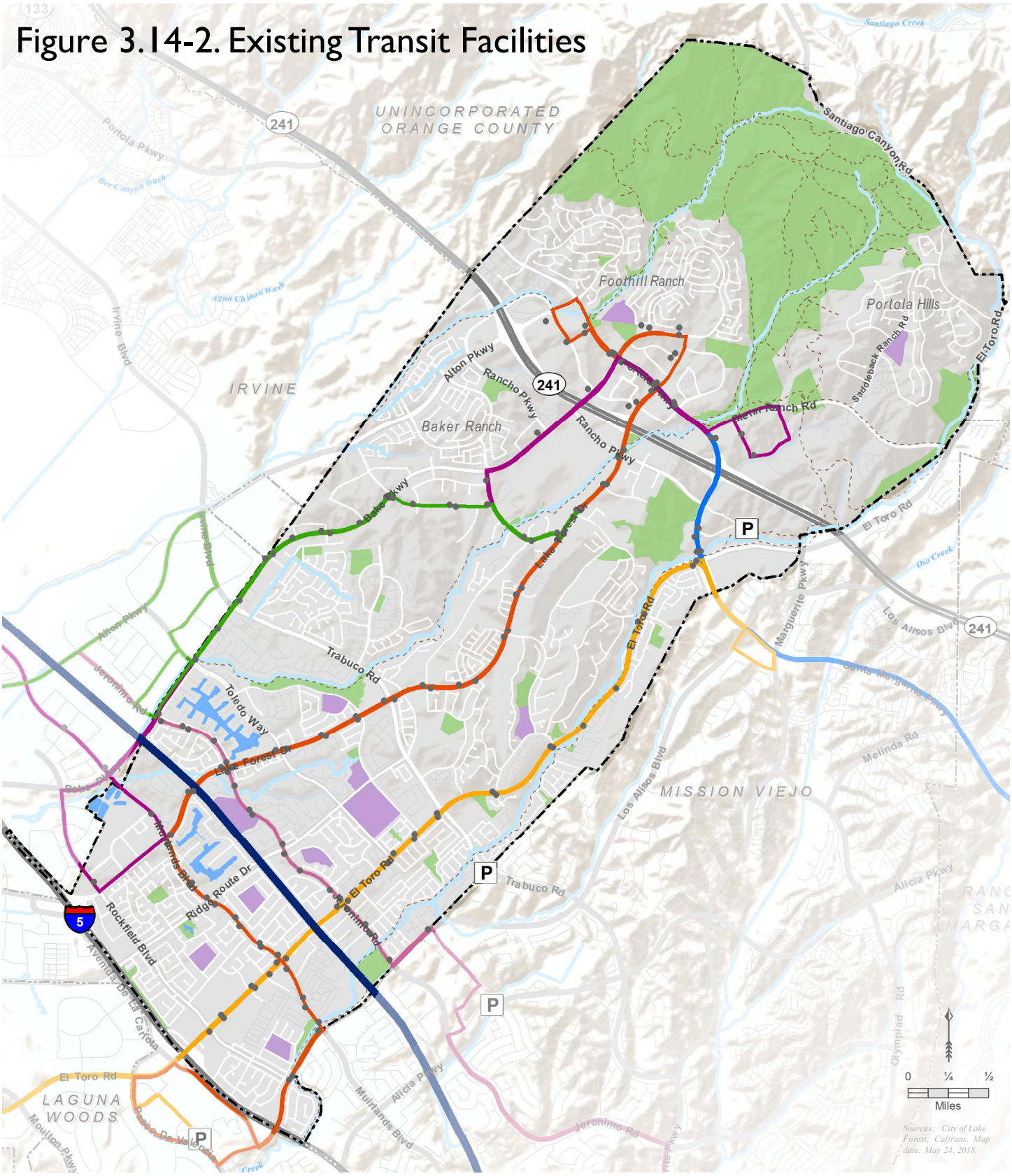
Figure 3.14-2. Existing Transit Facilities



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails

OCTA Bus Routes

- 82
- 86
- 89
- 177
- 206
- 480

- OCTA Bus Stops
- Metrolink/Amtrak
- P Park and Ride

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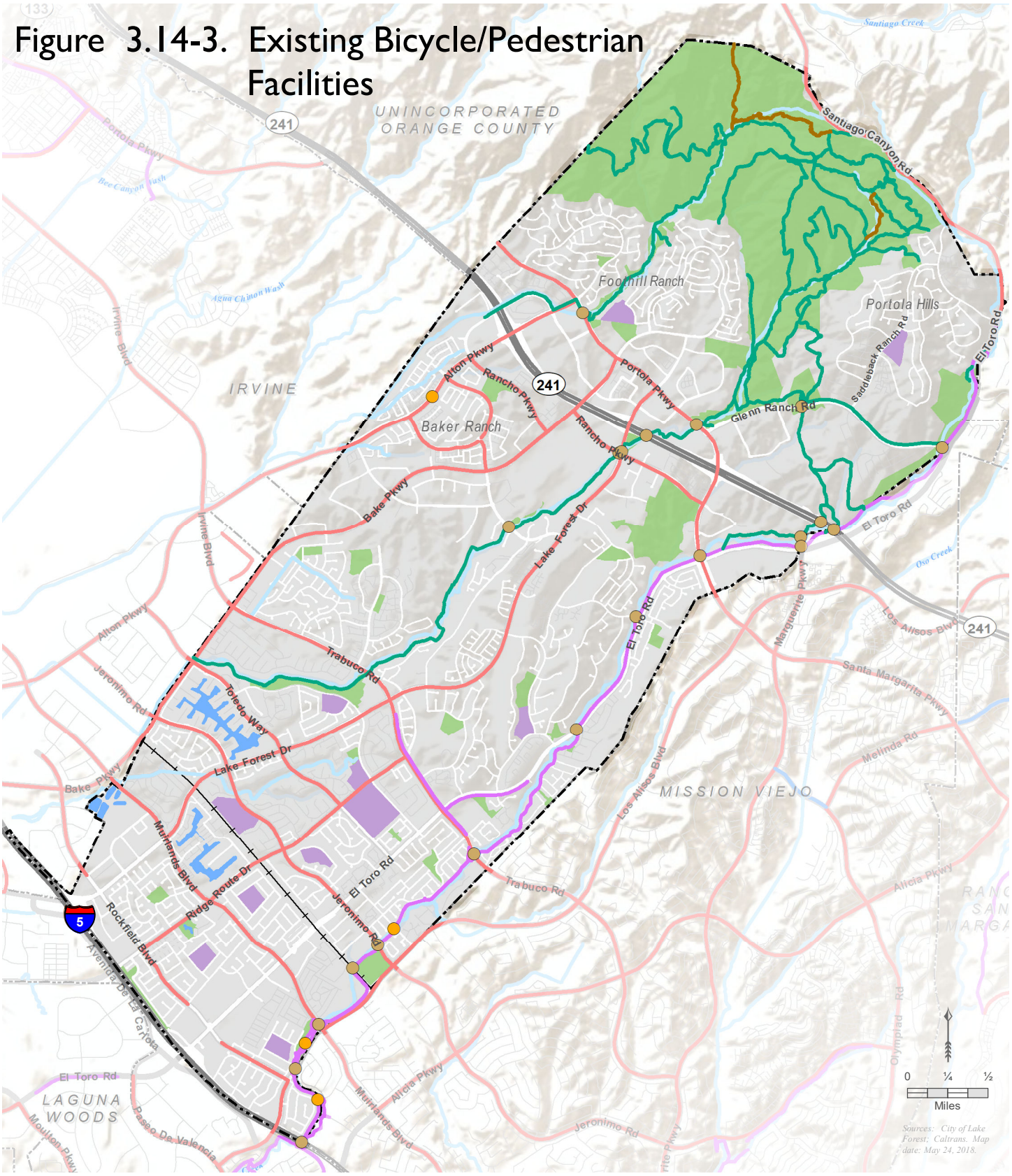
Figure 3.14-3. Existing Bicycle/Pedestrian Facilities



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Class I Bike Path
- Class II Bike Lanes
- Class III Bike Route
- Hiking-Only Trail
- Multi-Use Trail
- Bike/Pedestrian Bridge
- Bike/Pedestrian Underpass

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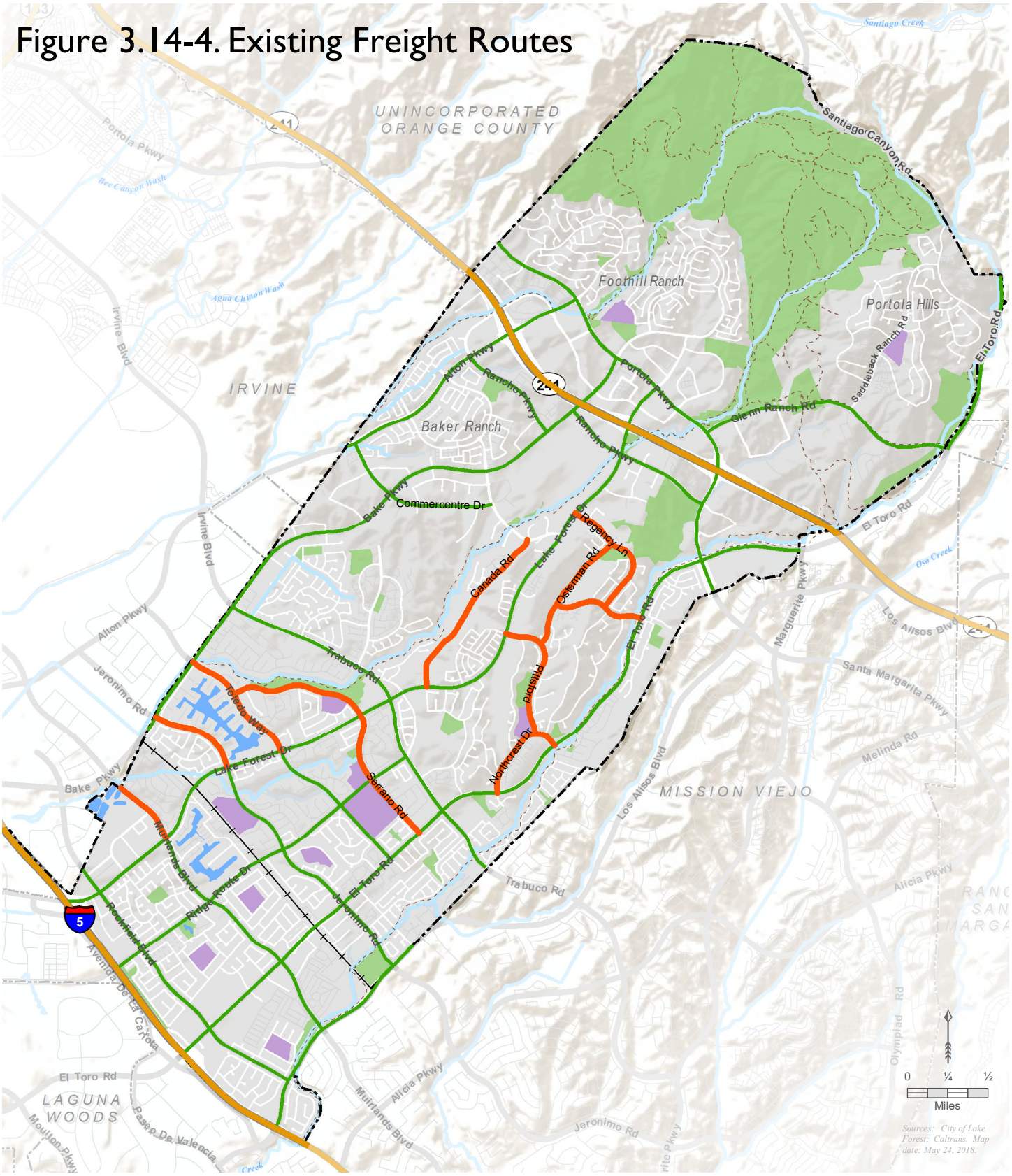
Figure 3.14-4. Existing Freight Routes



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails
- State Highway Truck Network
- Local Arterial Roadways
- Trucks Prohibited
- Rail

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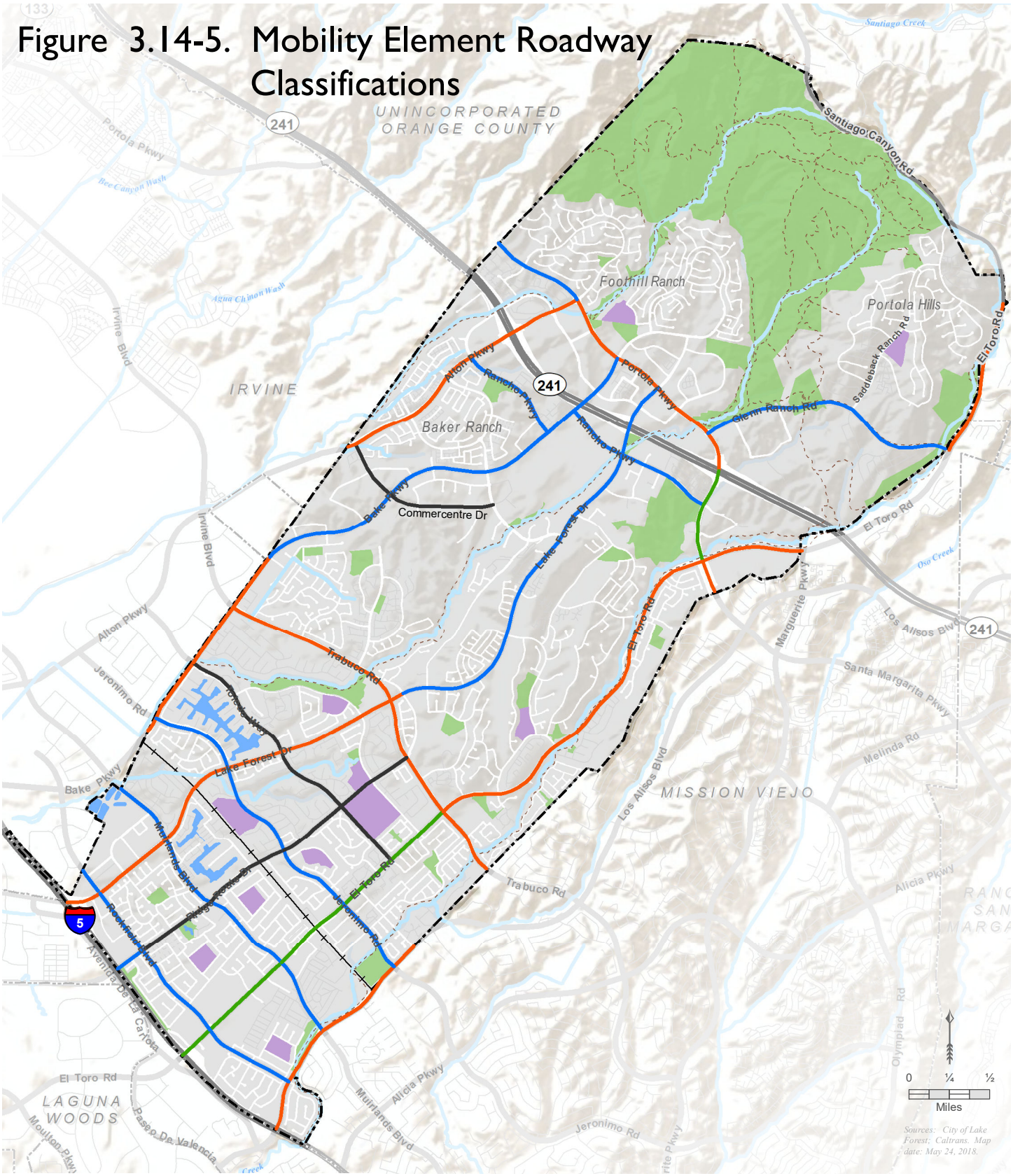
Figure 3.14-5. Mobility Element Roadway Classifications



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails

Roadway Classifications

- Principal Arterial
- Major Arterial
- Primary Arterial
- Secondary Arterial
- Collector

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Utilities are critical to providing safe drinking water, disposal and treatment of wastewater, stormwater drainage, and solid waste disposal. This section provides a background discussion of the utility systems in Lake Forest including water supplies, wastewater, storm drainage, and solid waste. This section is organized with an existing setting, regulatory setting, and impact analysis.

No Notice of Preparation (NOP) comments were received regarding this environmental topic.

3.15.1 WATER SUPPLIES

KEY TERMS

Acre feet: The volume of one acre of water to a depth of one foot. Each acre-foot of water is equal to approximately 325,851.4 gallons.

BGS: Below ground surface.

GPD: Gallons per day.

GPM: Gallons per minute.

Groundwater: Water that is underground and below the water table, as opposed to surface water, which flows across the ground surface. Water beneath the earth's surface fills the spaces in soil, gravel, or rock formations. Pockets of groundwater are often called "aquifers" and are the source of drinking water for a large percentage of the population in the United States. Groundwater is often extracted using wells which pump the water out of the ground and up to the surface. Groundwater is naturally replenished by surface water from precipitation, streams, and rivers when this recharge reaches the water table.

MG: Million gallons

MGD: Million gallons per day

Surface water: Water collected on the ground or from a stream, river, lake, wetland, or ocean. Surface water is replenished naturally through precipitation, but is lost naturally through evaporation and seepage into soil.

WATER DISTRIBUTION SYSTEM BY UTILITY DISTRICT

The City of Lake Forest does not directly provide water service to its residents. Rather, three separate, independent utility districts provide this service to residents within the City. The majority of the City of Lake Forest's residents are provided water, wastewater collection, and wastewater treatment services by the Irvine Ranch Water District (IRWD), whose boundaries cover 8,300 acres in the City, or approximately 83 percent of the total area of the City. However, residents located along the southwest edge of the City are provided these utility services by El Toro Water District (ETWD). ETWD serves approximately 1,421 acres or 13 percent of the total area of the City. Further, a small portion of residents in the northeastern section of the City are serviced by Trabuco

Canyon Water District (TCWD). Figure 3.15-1 shows the three utility districts' boundaries overlaid with the City's boundary. Figure 3.15-2 shows the water utility infrastructure.

Irvine Ranch Water District

The majority of the City is provided water service by IRWD. IRWD is one of the largest water districts in Orange County, serving approximately 132 square miles, including the entire City of Irvine and portions of Tustin, Santa Ana, Costa Mesa, Newport Beach, and Lake Forest. IRWD is a member agency of the Municipal Water District of Orange County (MWDOC), which is a wholesale importer and member agency of the Metropolitan Water District (MWD). As such, MWDOC is entitled to receive water from MWD's available sources. IRWD receives its imported water supplies through MWDOC.

A small portion of the City, the Portola Hills community, is located within the Trabuco Canyon Water District (TCWD) service area boundary, yet is provided water by IRWD. For this area, TCWD reads the meters and bills the residents, then IRWD bills TCWD for the total amount of water consumed by residents within the TCWD boundary.

WATER INFRASTRUCTURE

IRWD's potable water supply inside the borders of the City consists of nearly 250 miles of potable water lines. Due to the major elevation changes within the district, IRWD uses 15 pressure zones to deliver water to customers. Five of these pressure zones fall within the borders of the City; Lake Forest Zones 4, 5, and 6, Foothill Ranch Zone, and Portola Hills Zone.

POTABLE WATER SUPPLY

According to the most recent IRWD Water Master Plan update, groundwater makes up 53 percent of the total water supply, recycled water makes up 24 percent, imported (treated and untreated) makes up 20 percent, and native surface water makes up around three percent. In the 2014/2015 fiscal year, approximately 22 percent of IRWD's potable water needs were met through water purchased and supplied by MWD through MWDOC. The majority of IRWD's potable water is a blend of Colorado River water and State Water Project water that is treated at the MWD Diemer Filtration Plant (DFP) located north of Yorba Linda. Two major transmission lines deliver water from the DFP to IRWD, the Allen McColloch Pipeline (AMP) and East Orange County Feeder No. 2 (EOCF#2). IRWD owns 64.7 cubic feet per second (cfs) capacity in the AMP and 41.4 cfs capacity in the EOCF#2.

Groundwater currently makes up about 78 percent of the potable water supply in the district. Water is pumped from the Orange County Groundwater Basin through seven potable production wells. The Orange County Groundwater Basin is managed by Orange County Water District (OCWD) who has the authority to impose replenishment assessments and basin equity assessments on production. The primary mechanism used by OCWD to manage pumping from the basin is the Basin Production Percentage (BPP). The BPP is the percentage of each producer's water supply that is allowed from groundwater pumped from the basin without incurring a financial penalty. The BPP is set on an annual basis and is uniform for all producers within the

groundwater basin's watershed. Groundwater pumping above the BPP is assessed an additional charge that creates a disincentive for over-producing. Currently, and for the foreseeable future, the BPP is limited to 75 percent. The 2014 IRWD Water Resources Master Plan Update states IRWD is looking to expand groundwater production in the future to max out their groundwater production to the max BPP of 75 percent.

NON-POTABLE WATER SUPPLY

Non-potable water meets a large portion of the landscape irrigation demands within IRWD's service area. The non-potable supply consists primarily of recycled water that has been treated at IRWD's Michelson Water Recycling Plan (MWRP) and Los Alisos Water Recycling Plan (LAWRP). Untreated water supplements the recycled water supply through native runoff and the untreated imported water purchased and delivered to Irvine Lake.

Only the section of the City northeast of Trabuco Road and southwest of Highway 241 are currently served with non-potable water. The area of City south of Trabuco Road and the area north of Highway 241 are currently being provided a potable water supply for demands that could be served by non-potable water.

El Toro Water District

El Toro Water District (ETWD) provides service to residents in the southeast corner of the City. The district area is almost entirely built out with residential communities and serves the entire City of Laguna Woods as well as portions of Aliso Viejo, Laguna Hills, Laguna Woods, Lake Forest, and Mission Viejo. The Lake Forest and Mission Viejo sections of ETWD, which are the only sections east of U.S Interstate 5 (the I-5 highway), contain the highest elevations in the district and require pump stations to deliver water.

Like IRWD, ETWD is a member agency of the MWDOC. ETWD receives all its imported water supply through MWDOC.

WATER INFRASTRUCTURE

ETWD supplies water through approximately 50 miles of potable water lines within the City boundary. ETWD has a total of 13 pressure zones; however, only four of these zones serve the City: Shenandoah Zone, Cherry Zone, R-6 Zone, and Gravity Zone. The Shenandoah, Cherry, and R-6 Zones exclusively serve the City and are referred to by ETWD as the "Panhandle". These zones are the highest zones in elevation in the district and require pump stations to serve them directly. Gravity Zone is ETWD's largest pressure zone by area, serving parts of Lake Forest, Mission Viejo, Laguna Hills, Laguna Woods, and Aliso Viejo.

POTABLE WATER SUPPLY

ETWD relies completely on imported treated water from MWDOC to meet 100 percent of potable water demands. In general, imported water from MWDOC fills the District's 275 million gallon El Toro Reservoir (R-6), located just outside of ETWD in Mission Viejo, or directly feeds the

distribution system. The majority of imported water is delivered to ETWD through the MWDOC owned Allen-McColloch Pipeline (AMP) where ETWD owns the right to 26.3cfs of capacity.

ETWD also owns 2.0 cfs (1.29 million gallons per day, or mgd) capacity in the Joint Regional Water Supply System (JRWSS), which transports MWD treated water as well. The JRWSS is a take-off from MWD's EOCF#2. The JRWSS is managed, operated and maintained by the South Coast Water District (SCWD). Both the AMP and EOCF#2 originate at MWD's DFP located in Yorba Linda.

ETWD has an emergency supply source available to them through the Aufdenkamp Connection Transmission Main (ATCM), which is owned and operated by the Santa Margarita Water District (SMWD). ETWD does not own any capacity in the ATCM but may receive permission from SMWD to take water from the pipeline in an emergency situation.

NON-POTABLE WATER SUPPLY

ETWD recycles approximately 10 percent of the wastewater treated at the ETWD Water Recycling Plant, which amounts to approximately 0.5 mgd. The recycled water is primarily used for irrigation of the Leisure World Golf Course, which is located in the City of Laguna Woods. None of the recycled water is used in the City of Lake Forest.

Trabuco Canyon Water District

A portion of the City of Lake Forest's Portola Hills community is the only area that lies within TCWD boundaries. However, under terms of an agreement with IRWD, IRWD supplies water to the 532 connections. TCWD reads the meters and bills the customers for water service then IRWD bills TCWD for the water supplied to these customers. The evaluation of water demands indicates these customers have an average demand of 0.24 mgd and a maximum day demand of 0.48 mgd.

PROJECTED POTABLE WATER DEMANDS AND SUPPLY

Irvine Ranch Water District

Table 3.15-1 provides the total potable water demand and supply for the IRWD service area (not just the portion that serves the City of Lake Forest) in both acre-feet per year (AFY) and mgd.

TABLE 3.15-1: IWRD PROJECTED POTABLE WATER DEMAND VS. SUPPLY

	2015	*2020*	*2025*	*2030*	*2035*
DEMAND					
AFY	64,154	71,086	77,700	80,645	81,966
MGD	57.3	63.5	69.4	72.0	73.2
SUPPLY					
AFY	95,100	107,452	107,452	107,452	95,100
MGD	84.9	95.9	95.9	95.9	84.9
DIFFERENCE					
AFY	30,946	36,366	29,752	26,807	13,134
MGD	27.6	32.4	26.5	23.9	11.7

NOTE: ALL VALUES FROM IRWD'S 2015 URBAN WATER MANAGEMENT PLAN. THE 2015 VALUE IS THE ACTUAL CALCULATED DEMAND. ALL OTHER VALUES ARE PROJECTED.
SOURCE: WEST YOST ASSOCIATES, 2018.

The 2015 IRWD Urban Water Management Plan (UWMP) developed future water demand projections and future water supply projections for the entire utility district. As shown in Table 3.15-1, IRWD is projected to have significantly more supply than demand in 2035.

El Toro Water District

Since ETWD's service area is mostly built out, increases in future water demand would be through redevelopment of existing land uses. The 2004 ETWD Master Plan identifies a range of potential development scenarios that may create new water demands; however, given its age these projects will be reassessed and updated based on the results of the General Plan Update process. For reference, is estimated that these projects will increase the average day domestic water demand by 239 gpm, or 0.344 mgd, or 0.532 cfs.

The 2004 ETWD Master Plan states that the District's capacity in the AMP is equivalent to the maximum day demand, therefore the current supply is deemed adequate. Estimated future demands increase only slightly; therefore, additional turnout capacity is not anticipated. Projected potable water demand and supply values from the 2015 ETWD UWMP are presented in Table 3.15-2. Since ETWD relies completely on imported water from MWDOC, the available supply presented is equal to the demand.

TABLE 3.15-2: ETWD PROJECTED POTABLE WATER DEMAND VS. SUPPLY

	2015	*2020*	*2025*	*2030*	*2035*
DEMAND					
AFY	8,649	6,661	7,394	7,423	7,315
MGD	7.7	5.9	6.6	6.6	6.5
SUPPLY					
AFY	8,649	6,661	7,394	7,423	7,315
MGD	7.7	5.9	6.6	6.6	6.5
DIFFERENCE					
AFY	0	0	0	0	0
MGD	0.0	0.0	0.0	0.0	0.0

NOTE: ALL VALUES FROM ETWD'S 2015 URBAN WATER MANAGEMENT PLAN. THE 2015 VALUE IS THE ACTUAL CALCULATED DEMAND. ALL OTHER VALUES ARE PROJECTED. POTABLE WATER DEMAND DECREASES BETWEEN 2015 AND 2020 BECAUSE OF RECYCLED WATER CONVERSION FOR EXISTING POTABLE CUSTOMERS PLANNED BY ETWD.
SOURCE: WEST YOST ASSOCIATES, 2018.

Trabuco Canyon Water District

As previously stated, customers within the Portola Hills community are served potable water by IRWD but are billed through the Trabuco Canyon Water District (TCWD), therefore supply and demand are calculated utilizing Irvine Ranch Water District (IRWD) data. The community of Portola Hills (billed through TCWD) has an average day demand of 0.24 mgd and a maximum day demand of 0.48 mgd. The community is already built out and no redevelopment has been planned. Therefore, future flows are expected to remain the same. These Portola Hills TCWD demand values are included in the projected demand for IRWD in Table 3.15-1.

WATER SYSTEM ISSUES AND OPPORTUNITIES

Irvine Ranch Water District

The latest IRWD potable and non-potable water system analysis was developed and run for the 1999 IRWD Master Plan. Most of the Lake Forest service area belonged to LAWD at the time and was not included in the analysis. The only parts of the City that were included in the potable system analysis were the Foothill Ranch community and the Portola Hills community, northeast of Freeway 241. No section of Lake Forest was included in the non-potable system analysis.

IRWD relies on Sub-Area Master Plans (SAMPs) to determine infrastructure needs throughout its service area. A SAMP provides a focused evaluation of infrastructure requirements in a specific area of the IRWD service area, based upon the general evaluations performed for the master plan. It is likely that a SAMP would be developed in response to land use changes proposed by the City of Lake Forest General Plan Update.

El Toro Water District

For the 2004 ETWD Master Plan, a hydraulic model of the ETWD Water Distribution System was developed to identify any deficiencies in the system. The system was analyzed under the maximum day extended period simulation scenario for existing and anticipated future flows to identify deficiencies in the system like areas that exceed either the high or low-pressure criteria, areas that cannot provide fire flows, or pipes with velocities that exceed the criteria.

The only deficiencies identified by the model within the Lake Forest City boundary involved several areas in the R-6 Zone that could not provide adequate fire flows of 1,500 gpm at 20 psi. These areas are located near the intersection of Brookhaven and Alderwood or on Fallbrook (just across Trabuco). However, the model was used to verify that in an emergency situation, the nearby pressure reducing valve PR-20, which provides back-up supply from the Cherry Zone to the R-6 Zone, will open to assist in meeting fire flow demands.

Trabuco Canyon Water District

As discussed previously, IRWD provides water to residents in the Lake Forest Portola Hills community who are within the TCWD boundaries. Hydraulic analysis of the Portola Hills community was included in the IRWD hydraulic Analysis. There are no discrepancies in the Portola Hills community.

REGULATORY SETTING – WATER SUPPLIES

State

CALIFORNIA DEPARTMENT OF HEALTH SERVICES

The Department of Health Services, Division of Drinking Water and Environmental Management, oversees the Drinking Water Program. The Drinking Water Program regulates public water systems and certifies drinking water treatment and distribution operators. It provides support for small water systems and for improving their technical, managerial, and financial capacity. It provides subsidized funding for water system improvements under the State Revolving Fund ("SRF") and Proposition 50 programs. The Drinking Water Program also oversees water recycling projects, permits water treatment devices, supports and promotes water system security, and oversees the Drinking Water Treatment and Research Fund for MTBE and other oxygenates.

CALIFORNIA CODE OF REGULATIONS

California Code of Regulations (CCR) Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the Department of Health Services. The Consumer Confidence Report provides information regarding the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminants levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

CONSUMER CONFIDENCE REPORT REQUIREMENTS

CCR Title 22, Chapter 15, Article 20 requires all public water systems to prepare a Consumer Confidence Report for distribution to its customers and to the Department of Health Services. The Consumer Confidence Report provides information regarding the quality of potable water provided by the water system. It includes information on the sources of the water, any detected contaminants in the water, the maximum contaminant levels set by regulation, violations and actions taken to correct them, and opportunities for public participation in decisions that may affect the quality of the water provided.

URBAN WATER MANAGEMENT PLANNING ACT

The Urban Water Management Planning Act has as its objectives the management of urban water demands and the efficient use of urban water. Under its provisions, every urban water supplier is required to prepare and adopt an urban water management plan. An "urban water supplier" is a public or private water supplier that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. The plan must identify and quantify the existing and planned sources of water available to the supplier, quantify the projected water use for a period of 20 years, and describe the supplier's water demand management measures. The urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The Department of Water Resources must receive a copy of an adopted urban water management plan.

SENATE BILL (SB) 610 AND ASSEMBLY BILL (AB) 901

The State Legislature passed SB 610 and AB 901 in 2001. Both measures modified the Urban Water Management Planning Act.

SB 610 requires additional information in an urban water management plan if groundwater is identified as a source of water available to an urban water supplier. It also requires that the plan include a description of all water supply projects and programs that may be undertaken to meet total projected water use. SB 610 requires a city or county that determines a project is subject to CEQA to identify any public water system that may supply water to the project and to request identified public water systems to prepare a specified water supply assessment. The assessment must include, among other information, an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and water received in prior years pursuant to these entitlements, rights, and contracts.

AB 901 requires an urban water management plan to include information, to the extent practicable, relating to the quality of existing sources of water available to an urban water supplier over given time periods. AB 901 also requires information on the manner in which water quality affects water management strategies and supply reliability. The bill requires a plan to describe plans to supplement a water source that may not be available at a consistent level of use, to the extent practicable. Additional findings and declarations relating to water quality are required.

SENATE BILL (SB) 221

SB 221 adds Government Code Section 66455.3, requiring that the local water agency be sent a copy of any proposed residential subdivision of more than 500 dwelling units within five days of the subdivision application being accepted as complete for processing by the city or county. It also adds Government Code Section 66473.7, establishing detailed requirements for establishing whether a "sufficient water supply" exists to support any proposed residential subdivisions of more than 500 dwellings, including any such subdivision involving a development agreement. When approving a qualifying subdivision tentative map, the city or county must include a condition requiring availability of a sufficient water supply. The applicable public water system must provide proof of availability. If there is no public water system, the city or county must undertake the analysis described in Government Code Section 66473.7. The analysis must include consideration of effects on other users of water and groundwater.

Local

IRVINE RANCH WATER DISTRICT (IRWD)

IRWD is a California Special District formed in 1961 and incorporated under the California Water Code. IRWD offers potable water sales, sewer service and sale of reclaimed (or recycled) water, and has approximately 300,000 customers spanning over 180 square miles of service area in Orange County. IRWD serves approximately 83 percent of the total area of the City of Lake Forest.

IRWD 2015 URBAN WATER MANAGEMENT PLAN

IRWD's UWMP looks at IRWD's historic and current water use projections and compares water supplies with demands over the next 20 years. The UWMP serves as a long-range planning document for water supply and demand and provides an overview of IRWD's water supply and usage, recycled water and conservation programs.

The UWMP identifies the imported and local water supplies that will meet future demands including groundwater recovery and water recycling, as well as IRWD's current and planned conservation measures. This helps to ensure that IRWD can provide the City areas within its service area with a reliable supply of high-quality water and meet current and future demand. The plan is updated every five years and submitted to the California Department of Water Resources. At its June 27, 2016, meeting IRWD's Board of Directors conducted a public hearing and approved the 2015 UWMP.

EL TORO WATER DISTRICT (ETWD)

ETWD is California Special District formed in 1960 and receives its water from two main sources: recycled water, and imported water from the Municipal Water District of Orange County (MWDOC). The district serves over 50,000 people in southern Orange County. ETWD maintains a 275-million-gallon water storage facility. ETWD serves approximately 13 percent of the total area of the City of Lake Forest.

ETWD 2015 URBAN WATER MANAGEMENT PLAN

ETWD's UWMP provides a detailed summary of ETWD's present and future water resources and demands and assess the ETWD's water resource needs. The UWMP provides water supply planning for a 25-year planning period in five-year increments and identifies water supplies needed to meet existing and future demands. The demand analysis identifies supply reliability under three hydrologic conditions: a normal year, a single-dry year, and multiple-dry years.

TRABUCO CANYON WATER DISTRICT

TCWD is California Special District incorporated under the California Water Code. TCWD provides water service to customers and properties located within its boundaries. The district's primary facilities include a water treatment plant located in the City of Lake Forest, a wastewater treatment plant, and the Trabuco Creek Wells facility located in Trabuco Canyon. A small number of residents in the northeastern section of the City are served by TCWD.

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the project will have a significant impact on the environment associated with Utilities if it will:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas or telecommunication facilities, the construction or relocation of which could cause significant environmental effects; and/or
- Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.

IMPACTS AND MITIGATION MEASURES

Impact 3.15-1: General Plan implementation would result in sufficient water supplies available to serve the City and reasonably foreseeable future development during normal, dry and multiple dry years (Less than Significant)

Implementation of the General Plan would result in increased population and employment growth within the Planning Area, and a corresponding increase in the demand for additional water supplies.

As described in Chapter 2.0 and summarized in Table 2.0-2, buildout of the General Plan could yield a total of up to 51,334 housing units, a population of 152,462 people, 27,726,585 square feet of non-residential building square footage, and 52,241 jobs within the Planning Area. This represents development growth over existing conditions of up to 22,406 new housing units, 70,574 people, 12,410,885 square feet of new non-residential building square footage and 14,202 jobs.

As noted in Chapter 2.0, Project Description, the difference between the "Business as Usual" (BAU) current General Plan projections and the proposed Lake Forest 2040 General Plan Update projection were calculated for several key values (residential units, population, non-residential square footage, and jobs) across the City. For this analysis, parcel-level evaluation was performed to determine these differences for each focus area. The results can be seen in Table 3.15-3.

TABLE 3.15-3: NET GAIN IN KEY DEMOGRAPHIC VALUES FROM BAU CURRENT GENERAL PLAN BUILDOUT TO PROPOSED GENERAL PLAN BUILDOUT

FOCUS AREA	*SERVICE*	*RES UNITS*	*POP.*	*NON-RES SF*	*JOBS*
El Toro Road Corridor	ETWD	3,253	9,662	548,141	1,145
Lake Forest Drive Corridor	IRWD	3,177	9,435	583,608	1,627
Lake Forest Civic Center Area	IRWD	2,859	8,491	386	159
Foothill Ranch Towne Center	IRWD	5,007	14,869	810,521	1,801
Light Industrial/Rail Corridor	ETWD/IRWD	950	2,823	62,328	90

SOURCE: WEST YOST ASSOCIATES, 2019.

It should be noted that the values in Table 3.15-3 convey the difference at buildout between the BAU current General Plan and the proposed Lake Forest 2040 General Plan. As such, the values convey the net impact of adopting the proposed Plan for each of the focus areas. With the net demographic impact for each focus area identified, the impact to the water system was calculated. To project water demand, wastewater flow was first generated using 50 gallons per day (gpd) per capita for residential usage, and using 120 gpd per 1,000 square feet for non-residential development. Water demand was then calculated using a 90 percent return to sewer ratio. These unit values are reasonable for development/redevelopment that is expected to be non-rural and for development that will have access to recycled water for most outdoor usage. The projected water demand impacts of the proposed General Plan can be seen in Table 3.15-4.

TABLE 3.15-4: NET INCREASE IN AVERAGE DAY WATER DEMAND FROM BAU CURRENT GENERAL PLAN BUILDOUT TO PROPOSED 2040 GENERAL PLAN BUILDOUT

FOCUS AREA	*SERVICE*	*NET INCREASE IN DEMAND, GPD*	*NET INCREASE IN DEMAND, AFY*
El Toro Road Corridor	ETWD	615,000	690
Lake Forest Drive Corridor	IRWD	608,000	680
Lake Forest Civic Center Area	IRWD	477,000	530
Foothill Ranch Towne Center	IRWD	942,000	1,060
Light Industrial/Rail Corridor	ETWD/IRWD	167,000	190

SOURCE: WEST YOST ASSOCIATES, 2019.

When the net impact to potable water demand is compared to the supply available to the two Districts, it can be seen that both Districts have ample water supply to account for buildout of the proposed General Plan. As such, this is a **less than significant** impact, and no mitigation is required.

The proposed General Plan includes a range of policies designed to ensure an adequate water supply for development and to minimize the potential adverse effects of increased water use. It is important to note that the City of Lake Forest does not provide water services within the Planning

Area. As such, responsibility for the ongoing provision of water supplies and services within Lake Forest falls to the respective water districts, as described above. Given that projected water demands associated with General Plan buildout would not exceed the projected available water supplies, and that the proposed General Plan includes a comprehensive set of goals and policies to ensure an adequate and reliable source of clean potable water, impacts associated with water supplies are **less than significant.** The policies listed below would further assist in ensuring that adequate water supplies are available to serve new growth projected under the proposed General Plan.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

PF-3.1: Coordination with Water Districts. Coordinate with local water districts when considering land use changes in order to assist the districts in planning for adequate capacity to accommodate future growth.

PF-3.2: Use of Recycled Water. Work collaboratively with local water districts to encourage the use of recycled water for irrigation.

PF-3.3: Water Pressure. Coordinate with local water districts and Orange County Fire Authority to encourage water pressures that remain high enough throughout all areas of the community to provided needed water capacity for fire protection.

PF-3.4: Emerging Technologies. Encourage service providers to explore the use of new technologies in the acquisition, treatment, distribution, and consumption of water including monitoring technologies, and other best practices.

PF-3.5: Educate the Public. Educate the public on water issues and conservation strategies, in partnership with water districts and regional partners; focus on business activities with the potential to pollute and distribute Best Management Practices (BMP) guidance for business activities.

PF-3.6: Water Conservation. Support water conservation measures that comply with state and federal legislation and that are consistent with measures adopted in all applicable Urban Water Management Plans.

Impact 3.15-2: General Plan implementation may require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (Less than Significant)

There may be local infrastructure impacts for each of the focus areas. Sub-Area master plans or development impact studies will likely be required by IRWD and ETWD for each of the focus areas to determine infrastructure impacts.

Development and growth in the City under the proposed General Plan would result in increased demand for water supplies, including water conveyance and treatment infrastructure. The

proposed General Plan includes policies and actions to ensure that water supplies are provided at acceptable levels and to ensure that development and growth does not outpace the provision of available water supplies.

As described under Impact 3.15-1, the projected 2040 water supplies are adequate to meet demand that would be generated by buildout of the General Plan. As such, implementation and buildout of the General Plan would not result in the need to construct or expand water supply and treatment facilities that have not already been described and accounted for in the Districts' relevant water master plans, which include the IRWD Water Master Plan and the ETWD Master Plan.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the General Plan, Municipal Code, and other applicable regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA.

The proposed General Plan includes a range of policies (listed above) to ensure that water providers serving the city are consulted with during future land use changes in order to ensure that future supply levels meet demands.

Future development in the Planning Area would be required to connect to existing water distribution infrastructure in the vicinity of each site, pay the applicable water system connection fees, and pay the applicable water usage rates. Future projects may be required to implement site specific and limited off-site improvements to the water distribution system in order to connect new project sites to the existing water infrastructure network. The specific impacts of providing new and expanded waster distribution infrastructure cannot be determined at this time, as the General Plan does not propose or authorize any specific development projects or include details on any future development projects. However, any future improvements to the existing water distribution infrastructure would be primarily provided on sites with land use designations that allow for urbanized land uses, and the environmental impacts of constructing and operating the new water distribution infrastructure would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the proposed General Plan. Therefore, this impact is considered **less than significant** and no additional mitigation is necessary.

3.15.2 WASTEWATER

The City of Lake Forest does not directly provide wastewater collection or wastewater treatment to its residents. Rather, three separate, independent utility districts provide these services to residents within the City. Figure 3.15-3 shows the utility district boundaries overlaid with the City's boundary.

KEY TERMS

Effluent: Effluent is an outflowing of water from a natural body of water, or from a man-made structure. Effluent in the man-made sense is generally considered to be water pollution, such as the outflow from a sewage treatment facility or the wastewater discharge from industrial facilities. In the context of waste water treatment plants, effluent that has been treated is sometimes called secondary effluent, or treated effluent.

NPDES: Water pollution degrades surface waters making them unsafe for drinking, fishing, swimming, and other activities. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

WWTP: Wastewater treatment plant. Treatment of wastewater may include the following processes: screening to remove large waste items; grit removal to allow sand, gravel, and sediment to settle out; primary sedimentation where sludge can settle out of the wastewater; secondary treatment to substantially degrade the biological content of the sewage; tertiary treatment to raise the quality of the effluent before it is discharged; and, discharge.

WASTEWATER TREATMENT AND SEWER COLLECTION

As with the water system, the City's sewer services are divided up by three utility districts, IRWD, ETWD, and TCWD. Among the three agencies, there are approximately 215 miles of sewer main within the borders of Lake Forest.

Irvine Ranch Water District

IRWD wastewater collection and treatment facilities are discussed below.

SEWER COLLECTION SYSTEM INFRASTRUCTURE

IRWD provides wastewater collection and wastewater treatment to the majority of residents in the City of Lake Forest. IRWD maintains approximately 175 miles of sewer mains within the City of Lake Forest. Wastewater flow originating within Lake Forest northeast of Highway 241 flows across the IRWD collection system to the MWRP. All other flow originating in Lake Forest is directed to

the LAWRP. Recycled water is produced at both plants, and recycled water makes up about 20 percent of IRWD's current water supply.

The 2014 IRWD Master Plan Update identifies five sewer sheds for the City of Lake Forest including Alton-Bake, Bake, El Toro; Muirlands Cherry, Lake Forest, and Portola. The Alton-Bake shed, located northeast of Highway 241 flows to MWRP, while the Bake, El Toro; Muirlands Cherry, and Lake Forest sheds flow to LAWRP. The Portola shed flows into the sewer system owned by TCWD.

WASTEWATER TREATMENT CAPACITY

The MWRP is located on Riparian Way south of Michelson Drive, on the northwest side of the San Diego Creek in the City of Irvine. As of 2008, the MWRP had a plant capacity of 18 mgd but it was recently expanded to a capacity of 28 mgd.

The LAWRP is located on the corner of Muirlands Boulevard and Aspen Street in the City of Lake Forest. As of 2014, the LAWRP had a plant capacity of 7.5 mgd but only approximately 3.43 mgd was being conveyed to the LAWRP for treatment.

El Toro Water District

ETWD wastewater collection and treatment facilities are discussed below.

SEWER COLLECTION SYSTEM INFRASTRUCTURE

The southeast portion of the City is served by ETWD. ETWD's most recent Water and Sewer Master Plan was published in 2004. ETWD maintains approximately 34 miles of sewer mains within the City of Lake Forest. The majority of the flow in the City's ETWD area is conveyed by gravity and eventually flows across the I-5 highway via an 18-inch trunk main southwest into Laguna Woods where the ETWD Water Recycling Plant (WRP) is located.

Flow originating from the community located just south of Ralph A. Gates Elementary School flows across the I-5 highway and into Laguna Woods south of the 18-inch trunk main. The flow then is directed to the Aliso Viejo Pump Station where it is pumped to the ETWD WRP. Wastewater from a few small residential streets at the far south end of the City flows southeast into Mission Viejo to Freeway Lift Station where it joins flow from Mission Viejo and is pumped to the ETWD collection system west of the I-5 highway.

WASTEWATER TREATMENT CAPACITY

The current ETWD WRP has an average flow capacity of 5.4 mgd but has the ability to accommodate up to 6 mgd during max month conditions. The ETWD WRP recycles about 10 percent of the water it treats.

Trabuco Canyon Water District

TCWD wastewater collection and treatment facilities are discussed below.

SEWER COLLECTION SYSTEM INFRASTRUCTURE

Residents who live in part of the Portola Hills community in the northeast section of the City are serviced by TCWD. TCWD's most recent Master Plan was created in 1999. TCWD's collection system consists of three zones that are served by gravity sewers and lift stations; Robinson Ranch Zone, Dove Canyon Zone, and El Toro Road Zone. The Portola Hills community falls within the El Toro Road Zone and consists of approximately eight miles of sewer mains. Flow from this community is directed into the El Toro Road Sewage Collection System, which is jointly-owned by TCWD, IRWD, and Santa Margarita Water District (SMWD). All flow from the El Toro Road Sewage Collection System is pumped into SMWD's wastewater collection system and is eventually treated at the Chiquita Water Reclamation Plant then disposed of.

WASTEWATER TREATMENT CAPACITY

As discussed above, the only section of Lake Forest which TCWD provides wastewater services for is a portion of the Portola Hills community. The amount of flow capacity available to the Portola Hills Community is limited by the total capacity that TCWD owns in SMWD's wastewater collection system and the Chiquita Water Reclamation Plant. The District owns 0.558 mgd of capacity in SMWD's wastewater collection system and Chiquita Water Reclamation Plant. 0.428 mgd is reserved specifically for TCWD's El Toro Road Zone. Of the 0.428 mgd reserved for the El Toro Road Zone, 0.158 mgd is reserved for its Portola Hills customers.

WASTEWATER FLOWS

Projected wastewater flows for the three districts serving the City are discussed below.

Irvine Ranch Water District

The projected future wastewater flows for each wastewater treatment facility are presented in Table 3.15-5 along with the treatment capacity discussed above. It should be noted that IRWD is currently performing a treatment master plan to evaluate alternatives for supplying adequate treatment capacity for its service area in the future.

El Toro Water District

The ETWD 2004 Master Plan identified yearly average flow through the WRP for years 2001-2003 based on monthly influent flow data. The results show a slight decrease in average influent flow for this period. Average daily flow was 5.29 mgd in 2001, 4.82 mgd in 2002, and 4.94 mgd in 2003. The Master Plan does not break down the existing flow for wastewater generated inside the City of Lake Forest, however it does break down increased projected flow specifically for the City of Lake Forest.

The ETWD 2004 Master Plan identified four possible areas of redevelopment within the borders of Lake Forest that will impact wastewater generation. The Arbor/El Toro Road redevelopment

project is a landscape project and will not generate any additional sewage. An existing light industrial area along El Toro Road is proposed to be redeveloped with a rail station, commercial property and multi-family residential. An additional 244 units are proposed to be added to the Saddleback Ranch Apartments located on Los Alisos Boulevard. The City also anticipates redeveloping the mobile home parks, approximately 120 aces, into master planned communities in the future. It is estimated that these projects will increase the average daily wastewater generation by 146.6 gpm, or 0.211 mgd.

The projected wastewater flows that are directed to the ETWD WRP are presented in Table 3.15-5 along with the treatment capacity.

Trabuco Canyon Water District

The 1999 TCWD Master Plan does not specifically identify any site-specific development. It is assumed the projected flows for the Portola Hills Community will stay below 0.158 mgd. The Portola Hills community is not included in Table 3.15-5.

TABLE 3.15-5: PROJECTED SEWER FLOW VS. TREATMENT CAPACITY (MILLION GALLONS PER DAY, MGD)

UTILITY DISTRICT	*PROJECTED BUILD-OUT FLOW*	*CURRENT TOTAL TREATMENT CAPACITY*
IRWD MWRP	32.6	28.0
IRWD LAWRP	5.0	7.5
ETWD WRP	6.9	6.0

SOURCE: WEST YOST ASSOCIATES, 2018.

SEWER COLLECTION SYSTEM AND WASTEWATER TREATMENT ISSUES AND OPPORTUNITIES

Collection system and treatment issues and opportunities are discussed below.

Irvine Ranch Water District

For the Existing System Analysis completed as part of the IRWD Master Plan, a model of the system was constructed in 1999 using Innovyze's InfoSWMM. This model was updated in 2014. The hydraulic analysis indicates that the trunk main in the Alton Parkway, which conveys flows from portions of the City, has future potential capacity deficiencies. IRWD relies on Sub-Area Master Plans (SAMPs) to determine infrastructure needs throughout its service area. A SAMP provides a focused evaluation of infrastructure requirements in a specific area of the IRWD service area, based upon the general evaluations performed for the master plan. It is likely that a SAMP would be developed in response to land use changes proposed by the City of Lake Forest General Plan Update (West Yost, 2018).

Trabuco Canyon Water District

There are currently no deficient pipes in the Portola Hills community, the only community in the City that is being serviced by TCWD. As stated above, the amount of flow capacity is limited by the total capacity that TCWD owns in SMWD's wastewater collection system and the Chiquita Water Reclamation Plant. However, due to its small area of influence inside the City of Lake Forest, TCWD

is not expected to have any significant issues in terms of capacity in the City and development in the future will not be an issue.

El Toro Water District

As of the 2004 ETWDMP, there were no deficient pipes in the existing collection system according to the model. The 2004 El Toro Water District Master Plan identified possible development in four areas within their system inside the borders of Lake Forest. The projects were estimated to increase average daily wastewater generation created by the City by 146 gpm. The model was run again with the projected increased wastewater generation values from the four possible development areas along with a 20 percent increase due to inflow and infiltration (I&I). The results were analyzed for the WRP and the existing sewer mains and are summarized by West Yost below.

The ETWD WRP was analyzed to determine if it had sufficient capacity to accommodate the development contemplated under General Plan buildout. The WRP was completely reconstructed in 1998 to accommodate the increased demands from heavy commercial and residential development during the 1990's and now has a capacity under an average flow condition of 5.4 mgd. The WRP also has the ability to accommodate maximum month flows up to 6 mgd. After a capacity analysis was completed, it was found that the WRP capacity was adequate to treat flows after construction of all proposed developments within the entire ETWD identified in the Master Plan.

Pipelines were analyzed to determine if there would be any deficiencies as wastewater flow increased due to the development contemplated under General Plan buildout. After the model was run under the future loading condition with I&I, a total of 56 pipes exceeded the criteria for d/D (flow depth/pipe diameter) of 75 percent, with 40 of those pipes having a d/D value of 100 percent (indicating surcharging). Many of the deficient pipes identified are within the City of Lake Forests borders.

REGULATORY SETTING - WASTEWATER

State

STATE WATER RESOURCES CONTROL BOARD/REGIONAL WATER QUALITY CONTROL BOARD

In California, all wastewater treatment and disposal systems fall under the overall regulatory authority of the State Water Resources Control Board (SWRCB) and the nine California Regional Water Quality Control Boards (RWQCBs), who are charged with the responsibility of protecting beneficial uses of State waters (ground and surface) from a variety of waste discharges, including wastewater from individual and municipal systems. The City of Lake Forest falls within the jurisdiction of two Regional Water Quality Control Boards (RWQCBs): the Santa Ana RWQCB and the San Diego RWQCB.

The RWQCB's regulatory role often involves the formation and implementation of basic water protection policies. These are reflected in the individual RWQCB's Basin Plan, generally in the form of guidelines, criteria and/or prohibitions related to the siting, design, construction, and maintenance of on-site sewage disposal systems. The SWRCB's role has historically been one of

providing overall direction, organizational and technical assistance, and a communications link to the State legislature.

The RWQCBs may waive or delegate regulatory authority for on-site sewage disposal systems to counties, cities or special districts. Although not mandatory, it is commonly done and has proven to be administratively efficient. In some cases, this is accomplished through a Memorandum of Understanding (MOU), whereby the local agency commits to enforcing the Basin Plan requirements or other specified standards that may be more restrictive. The RWQCBs generally elect to retain permitting authority over large and/or commercial or industrial on-site sewage disposal systems, depending on the volume and character of the wastewater.

Local

IRVINE RANCH WATER DISTRICT

IRWD is a California Special District formed in 1961 and incorporated under the California Water Code. IRWD offers potable water sales, sewer service and sale of reclaimed (or recycled) water, and has approximately 300,000 customers spanning over 180 square miles of service area in Orange County. IRWD serves approximately 83 percent of the total area of the City of Lake Forest. IRWD provides wastewater collection and wastewater treatment to the majority of residents in the City. IRWD maintains approximately 175 miles of sewer mains within the City of Lake Forest.

EL TORO WATER DISTRICT

The ETWD is California Special District formed in 1960 and incorporated under the California Water Code. ETWD maintains 34 miles of sewer mains within the City of Lake Forest. The majority of the flow in the area within Lake Forest served by ETWD is conveyed by gravity and eventually flows across the I-5 highway via an 18-inch main southwest into Laguna Woods where the ETWD Water Recycling Plant is located.

TRABUCO CANYON WATER DISTRICT

The TCWD is California Special District incorporated under the California Water Code. TCWD's wastewater collection system consists of three zones that are served by gravity sewers and lift stations; Robinson Ranch Zone, Dove Canyon Zone, and El Toro Road Zone. The portion of Lake Forest served by TCWD for sewer service is located within the El Toro Road Zone and consists of approximately 8 miles of sewer mains.

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with Utilities if it would:

- Require or result in the relocation or construction of new or expanded wastewater facilities, the construction or relocation of which could cause significant environmental effects; and/or
- Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the projects projected demand in addition to the providers existing commitments.

IMPACTS AND MITIGATION MEASURES

Impact 3.15-3: General Plan implementation has the potential to result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments (Less than Significant)

As with the water system, the City's sewer services are divided up by three utility districts, IRWD, ETWD, and TCWD. Among the three agencies, there are approximately 215 miles of sewer main within the borders of Lake Forest. As of 2008, the IRWD MWRP had a plant capacity of 18 mgd but it was recently expanded to a capacity of 28 mgd. As of 2014, the ETWD LAWRP had a plant capacity of 7.5 mgd but only approximately 3.43 mgd was being conveyed to the LAWRP for treatment. As discussed above, the only section of Lake Forest which TCWD provides wastewater services for is a portion of the Portola Hills community. The amount of flow capacity available to the Portola Hills Community is limited by the total capacity that TCWD owns in SMWD's wastewater collection system and the Chiquita Water Reclamation Plant. The District owns 0.558 mgd of capacity in SMWD's wastewater collection system and Chiquita Water Reclamation Plant. 0.428 mgd is reserved specifically for TCWD's El Toro Road Zone. Of the 0.428 mgd reserved for the El Toro Road Zone, 0.158 mgd is reserved for its Portola Hills customers.

As Lake Forest continues to develop in the future, there will be an increased need for water and wastewater services, including a reliable source of recycled water. These needs have been addressed in the three utility districts' master plans and will require that the districts, in coordination with the City, continue to implement phased improvements to some pump stations, sewer mains, and the various wastewater treatment plants when triggered by growth.

The net average daily flow (ADF) wastewater impacts of the proposed Lake Forest 2040 General Plan Update can be seen in Table 3.15-6. The projected flows for each district are not expected to exceed the treatment capacity available for the districts, assuming that the majority of the flow generated in the IRWD service area is conveyed to the LAWRP for treatment. There may be local infrastructure impacts for each of the focus areas. Sub-Area master plans or development impact

studies may be required by IRWD and ETWD for each of the focus areas to determine infrastructure impacts.

TABLE 3.15-6. NET INCREASE IN WASTEWATER ADF FROM BAU CURRENT GENERAL PLAN BUILDOUT TO PROPOSED 2040 GENERAL PLAN BUILDOUT

FOCUS AREA	*SERVICE*	*NET INCREASE IN ADF, GPD*
El Toro Road Corridor	ETWD	554,000
Lake Forest Drive Corridor	IRWD	547,000
Lake Forest Civic Center Area	IRWD	429,000
Foothill Ranch Towne Center	IRWD	848,000
Light Industrial/Rail Corridor	ETWD/IRWD	150,000

SOURCE: WEST YOST ASSOCIATES, 2018.

While full buildout of the development contemplated in the proposed General Plan would slightly increase the existing treatment demand at the districts' treatment plants, the proposed General Plan includes a range of policies designed to ensure an adequate wastewater treatment capacity for development. As described above, the districts must also periodically review and update their Master Plans, and as growth continues to occur within the Planning Area, the districts, in coordination with the City, will identify necessary system upgrades and capacity enhancements to meet growth, prior to the approval of new development.

Given that projected wastewater generation volumes associated with General Plan buildout would not exceed the projected wastewater generation volumes described in the IRWD Master Plan and ETWD Master Plan, this impact would be **less than significant**, and no mitigation is required.

However, the proposed General Plan includes a comprehensive set of goals, policies, and actions to ensure an adequate and reliable wastewater collection and treatment system. The policies and actions listed below would further assist in ensuring that adequate wastewater treatment and conveyance infrastructure is available to serve new growth projected under the proposed General Plan.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

<u>PF-4.1: Statewide Requirements</u>. Encourage water district compliance with the current Statewide General Waste Discharge Requirements concerning the operation and maintenance of sanitary sewer collection systems.

<u>PF-4.2: Sewer Deposit Best Practices</u>. Encourage wastewater service providers to identify and implement best practices and feasible technologies for wastewater collection and treatment, including those that reduce the amount of wastewater requiring treatment, prevent contamination, maintain the highest possible energy efficiency, and reduce costs and greenhouse gas (GHG) emissions.

PF-4.3: Reduced System Demand. Reduce wastewater system demand by encouraging water-conserving designs and equipment, encouraging water-conserving devices, and designing wastewater systems to minimize inflow and infiltration.

PF-4.4: Recycled Water. Work with water districts and end users to increase and maximize the use of recycled water for existing and future needs as new technology, funding, and infrastructure is available.

PF-4.5: Service Levels. Coordinate with water districts on proposed land use changes so that they can plan for adequate delivery of services to future development in Lake Forest.

PF-4.6: Public Education. Collaborate with water districts in developing a public education program that teaches residents and businesses how to help maintain a safe and clean wastewater system, such as by limiting the amount of oils, pesticides, and toxic chemicals entering the sewer system.

Impact 3.15-4: General Plan implementation may require or result in the relocation or construction of new or expanded wastewater facilities, the construction or relocation of which could cause significant environmental effects (Less than Significant)

Development contemplated under the proposed General Plan would result in increased wastewater flows, resulting in the need for additional or expanded wastewater treatment facilities and conveyance infrastructure, as described above.

The infrastructure and facilities necessary to serve new growth would involve development of some facilities on new development sites, some facilities off-site, such as at existing wastewater treatment facilities, on appropriately designated land, and may also involve improvements to other existing facilities and disturbance of existing rights-of-way. The specific impacts of providing new and expanded facilities cannot be determined at this time, as the General Plan does not propose or approve development nor does it designate specific sites for new or expanded public facilities.

Wastewater treatment and conveyance facilities would be evaluated at the project-level in association with subsequent development projects. However, the facilities would be primarily provided on sites with land use designations that allow such uses and the environmental impacts of constructing and operating the facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the General Plan. As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the General Plan, Municipal Code, and other applicable regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. As such, this impact would be less than significant, and no additional mitigation is required.

The proposed General Plan includes policies designed to ensure adequate wastewater treatment capacity is available to serve development and to minimize the potential adverse effects of wastewater treatment. These policies are listed in Impact 3.15-3.

3.15.3 STORMWATER DRAINAGE

The information in this section focuses on the potential for the General Plan to result in the demand for new or expanded stormwater drainage facilities. Section 3.10 (Hydrology) includes an expanded analysis of water quality, flooding, and other stormwater related issues.

STORMWATER AND FLOOD CONTROL FACILITIES

The City's stormwater control systems are currently owned and operated by the City of Lake Forest. Until recently, the Orange County Flood Control District owned and operated the stormwater control system within the City. The City took over control of all facilities recently and is currently in the process of tracking, mapping, and analyzing the facilities.

At this time, the City does not have its own mapping of the stormwater facilities; however, these are currently mapped by the Orange County Flood Control District. These maps have dates ranging from 2000 to 2007.

REGULATORY SETTING - STORMWATER DRAINAGE

Federal

CLEAN WATER ACT (CWA)

The CWA, initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the act establishes a framework for regulating municipal and industrial stormwater discharges under the NPDES Program. Section 402(p) requires that stormwater associated with industrial activity that discharges either directly to surface waters or indirectly through municipal separate storm sewers must be regulated by an NPDES permit.

The SWRCB is responsible for implementing the CWA and does so through issuing NPDES permits to cities and counties through regional water quality control boards. Federal regulations allow two permitting options for storm water discharges (individual permits and general permits). Pursuant to Section 402 of the CWA and the Porter-Cologne Water Quality Control Act, municipal stormwater discharge in the City of Lake Forest is subject to the Waste Discharge Requirements (WDRs) of the MS4 Permit (Order Number R8-2016-0001) and NPDES Permit No. CAS618030.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges to navigable waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, oceans, dry stream beds, wetlands, and storm sewers that are tributary to any surface water body. NPDES permits are issued under the CWA, Title IV, Permits and Licenses, Section 402 (33 USC 466 et seq.).

The RWQCB issues these permits in lieu of direct issuance by the Environmental Protection Agency, subject to review and approval by the EPA Regional Administrator (EPA Region 9). The terms of these NPDES permits implement pertinent provisions of the CWA and the Act's

implementing regulations, including pre-treatment, sludge management, effluent limitations for specific industries, and anti-degradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the RWQCB are also Waste Discharge Requirements issued under the authority of the CWA.

These NPDES permits regulate discharges from publicly owned treatment works, industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less, and therefore must be updated regularly. To expedite the permit issuance process, the RWQCB has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. The SWRCB has issued general permits for stormwater runoff from construction sites statewide. Stormwater discharges from industrial and construction activities in Lake Forest can be covered under these general permits, which are administered jointly by the SWRCB and RWQCB.

Construction throughout the City of Lake Forest could disturb more than one acre of land surface for centralized and regional structural Best Management Practices (BMPs) (and possibly for those distributed structural BMPs larger than one acre), affecting the quality of stormwater discharges into waters of the United States. The City would therefore be subject to the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ, NPDES No. CAS000002, Construction General Permit [CGP]), as amended by Order 2010-0014-DWQ and Order 2012-0006-DWQ). The CGP regulates discharges of pollutants in stormwater associated with construction activity to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface.

The CGP requires the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes specific BMPs designed to prevent pollutants from contacting stormwater and keep all products of erosion from moving off-site into receiving waters. The SWPPP BMPs are intended to protect surface water quality by preventing the off-site migration of eroded soil and construction-related pollutants from the construction area.

State

CALIFORNIA WATER CODE

California's primary statute governing water quality and water pollution issues with respect to both surface waters and groundwater is the Porter-Cologne Water Quality Control Act of 1970 (Division 7 of the California Water Code) (Porter-Cologne Act). The Porter-Cologne Act grants the SWRCB and each of the Regional Water Quality Control Boards (RWQCBs) power to protect water quality, and is the primary vehicle for implementation of California's responsibilities under the Federal Clean Water Act. The Porter-Cologne Act grants the SWRCB and the RWQCBs authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require cleanup of discharges of hazardous materials and

other pollutants. The Porter-Cologne Act also establishes reporting requirements for unintended discharges of any hazardous substance, sewage, or oil or petroleum product.

Each RWQCB must formulate and adopt a Water Quality Control Plan (Basin Plan) for its region. The regional plans are to conform to the policies set forth in the Porter-Cologne Act and established by the SWRCB in its State water policy. The Porter-Cologne Act also provides that a RWQCB may include within its regional plan water discharge prohibitions applicable to particular conditions, areas, or types of waste.

WATER QUALITY CONTROL PLAN (BASIN PLAN)

A Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. The Basin Plan is a resource for the Regional Board and others who use water and/or discharge wastewater in the region that the Basin Plan is designed to cover. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues. The City of Lake Forest is split between two regions – the Santa Ana River Basin and the San Diego River Basin, approximately delineated by El Toro Road.

WATER QUALITY CONTROL PLAN (BASIN PLAN) FOR THE SANTA ANA RIVER BASIN

The Santa Ana Region (Region 8) includes the upper and lower Santa Ana River watersheds, the San Jacinto River watershed, and several other small drainage areas. The Santa Ana Region covers parts of southwestern San Bernardino County, western Riverside County, and northwestern Orange County. The northwestern portion of the City of Lake Forest, approximately north of El Toro Road, is located within this region.

WATER QUALITY CONTROL PLAN (BASIN PLAN) FOR THE SAN DIEGO BASIN

The San Diego Region (Region 9) occurs within the Peninsula Range Physiographic Province of California. One of the most prominent physical features in the region is the northwest-trending Peninsula Range which includes from the north to south, the Santa Ana, Agua Tibia, Palomar, Volcan, Cuyamaca and Laguna Mountains. The southeastern portions of the City fall under the requirements of the San Diego Regional Water Quality Control Board. The San Diego Region is divided into a coastal plain area, a central mountain-valley area, and an eastern mountain valley area. The southern portion of the City of Lake Forest is located within this region.

STATE WATER RESOURCE CONTROL BOARD (STATE WATER BOARD) STORM WATER STRATEGY

The Storm Water Strategy is founded on the results of the Storm Water Strategic Initiative, which served to direct the State Water Board's role in storm water resources management. The Storm Water Strategy developed guiding principles to serve as the foundation of the storm water program; identified issues that support or inhibit the program from aligning with the guiding principles; and proposed and prioritized projects that the Water Boards could implement to address those issues. The State Water Board staff created a strategy-based document called the Strategy to Optimize Management of Storm Water (STORMS). STORMS includes a program vision,

missions, goals, objectives, projects, timelines, and consideration of the most effective integration of project outcomes into the Water Board's Storm Water Program.

Local

ORANGE COUNTY DRAINAGE AREA MANAGEMENT PLAN

The specific water pollutant control elements of the Orange County Stormwater Program are documented in the 2003 Drainage Area Management Plan (DAMP) which is the County's primary policy, planning and implementation document for municipal NPDES Stormwater Permit compliance. The DAMP was prepared and is periodically updated using a consensus building process that involving public and private sector input and public review through the California Environmental Quality Act (CEQA) process. The DAMP is the principal guidance and compliance document for the county-wide implementation of the stormwater program and provides a foundation for the Orange County Stormwater Permittees to implement model programs designed to prevent pollutants from entering receiving waters to the maximum extent practicable. Review the Orange County DAMP.

CITY OF LAKE FOREST LOCAL IMPLEMENTATION PLAN

The City Local Implementation Plan (LIP) is the principal guidance and compliance document specific to the City of Lake Forest. The LIP provides description and detail of the City's water quality program implementation activities. The LIP is designed to work in conjunction with the Orange County DAMP.

ORANGE COUNTY STORMWATER RESOURCE PLAN

The Orange County Stormwater Resource Plan (OC SWRP) was prepared by Orange County per the requirements of SB 985. SB 985 requires the preparation of a Storm Water Resource Plan as an eligibility requirement for an entity to receive grant funding from a voter-approved bond initiative for a storm water and/or urban runoff project. Four primary significant planning efforts referenced throughout this OC SWRP are used for functional equivalency to meet the SWRP guidelines. These include (1) the 2013/2014 Reports of Waste Discharge (ROWDs), (2) Integrated Regional Watershed Management Plans for North, Central and South Orange County, (3) Watershed Infiltration and Hydromodification Management Plan (WIHMP) mapping tools, and (4) the South Orange County Water Quality Improvement Plan (WQIP).

MUNICIPAL NPDES PERMIT WASTE DISCHARGE REQUIREMENTS

On May 19, 2009, the Santa Ana Regional Water Quality Control Board adopted Order No. R8-2009-0030, NPDES No. CAS618030. On December 16, 2009, the San Diego Regional Water Quality Control Board adopted Order No. R9-200-0002, NPDES No. CAS018740. These Municipal NPDES Permits require the permittees to continue to implement stormwater quality management programs and develop additional programs in order to control pollutants in stormwater discharges.

The City of Lake Forest is split by the jurisdictional boundaries of two California Regional Water Quality Control Boards. The northwestern portions of the City fall under the requirements of the Santa Ana Regional Water Quality Control Board, and the southeastern portions of the City fall under the requirements of the San Diego Regional Water Quality Control Board. The jurisdictional boundaries are defined by the geographic division of watersheds; however, the boundary line can roughly be delineated by El Toro Road.

CITY OF LAKE FOREST REGIONAL WATER MANAGEMENT PLAN (IRWMP)

Within Orange County, water resource management has been structured into three primary Watershed Management Areas (WMA):

- North Orange County WMA
- Central Orange County WMA
- South Orange County WMA

The 11 watersheds in Orange County were grouped by similar characteristics into these three WMAs. The City of Lake Forest is an active participating member of the Central and South Orange County WMAs.

At its essence, the Watershed Management Area is a collaborative framework for municipalities and special purpose agencies to work collaboratively and find synergies across water resource disciplines. Its purpose is to bring together a wide variety of water resource managers in order to achieve more comprehensive and cost-effective solutions to Orange County's water resources needs. Member agencies voluntarily enter into a cooperative agreement that forms the WMA.

Governance includes a policy committee of elected officials, the Executive Committee, to oversee each Watershed Management Area. Senior staff from each member organization form a Management Committee to develop a joint work plan and oversee its implementation. Regular stakeholder forums are held to involve the public and share information across organizations within each Watershed Management Area.

These WMA groups and respective committees meet together on a regular basis to collaborate on water resource issues, including water supply, surface water quality, flood management, wastewater, and natural resource protection. Integrated Regional Water Management Plans (IRWMPs) have been completed for each WMA. Goals and solutions specific to each Watershed Management Area are formulated through consensus with participating stakeholders. Likewise, a custom slate of projects and programs is developed to address the water resource needs of each WMA. The Central and South Orange County WMAs have existing cooperative agreements in place.

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with Utilities if it would:

- Require or result in the relocation or construction of new or expanded storm water drainage facilities, the construction or relocation of which could cause significant environmental effects.

IMPACTS AND MITIGATION MEASURES

Impact 3.15-5: General Plan implementation may require or result in the relocation or construction of new or expanded storm water drainage facilities, the construction or relocation of which could cause significant environmental effects (Less than Significant)

Development under the proposed General Plan would result in increased areas of impervious surfaces throughout the Planning Area, resulting in the need for additional or expanded stormwater drainage, conveyance, and retention infrastructure. The infrastructure and facilities necessary to serve new growth would involve development of some facilities on-site within new development projects, some facilities off-site on appropriately designated land, and may also involve improvements to existing facilities and disturbance of existing rights-of-way. The specific impacts of providing new and expanded drainage facilities cannot be determined at this time, as the General Plan does not propose or approve any specific development project nor does it designate specific sites for new or expanded public facilities.

Stormwater drainage and conveyance facilities would be evaluated at the project-level in association with subsequent development projects. However, the facilities would be primarily provided on sites with land use designations that allow such uses and the environmental impacts of constructing and operating the facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the General Plan.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the General Plan, Municipal Code, and other applicable regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA. As such, this is a less than significant impact and no additional mitigation is required.

The policies and actions listed below would further ensure that there is adequate stormwater drainage and flood control infrastructure to serve future development under the General Plan, and would ensure that future drainage and flood control infrastructure projects do not result in adverse environmental impacts.

GENERAL PLAN POLICIES AND ACTIONS THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

PF-5.1: Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.

PF-5.2: Data Collection. Encourage the Orange County Flood Control District to map, track, and analyze data on all current storm drain facilities in order to provide clear and accurate forecasts for future demand.

PF-5.3: Stormwater Runoff. Encourage that stormwater be directed towards permeable surfaces to allow for more percolation of stormwater into the ground.

PF-5.4: Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rain water for non-potable uses in compliance with applicable State regulations.

PF-5.5: Recycled water. Explore the expansion of infrastructure for recycled stormwater for irrigation and other non-potable uses when safe, financially feasible, and available.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that maximizes retention of natural resources and provision of recreation opportunities along the community's creeks.

PF-5.8: County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

ACTIONS

PF-5a: Continue to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased beyond pre-development levels during rain and flood events.

PF-5b: Project designs shall minimize drainage concentrations, minimize impervious coverage, utilize pervious paving materials, utilize low impact development (LID) strategies, and utilize Best Management Practices (BMPs) to reduce stormwater runoff.

PF-5c: Promote the use of LID strategies in new development and redevelopment projects, including but not limited to the use of canopy trees and shrubs, vegetated swales, and permeable paving.

PF-5d: Require new development to mitigate increases in stormwater peak flows and/or volume. Mitigation measures, such as LID strategies, should take into consideration impacts on adjoining lands in the City.

PF-5e: Identify which storm water and drainage facilities are in need of repair and address these needs through the City's Capital Improvement Program.

3.15.4 SOLID WASTE

The City of Lake Forest has a sole-source contract with CR&R Incorporated Environmental Services to collect solid waste, recycling, and green waste from the residential and commercial sectors. CR&R Incorporated Environmental Services serves more than 3 million people and over 25,000 businesses throughout Orange, Los Angeles, San Bernardino, Imperial and Riverside Counties. The CR&R vehicle fleet in Lake Forest uses natural gas vehicles and pick-up services usually occur weekly.

KEY TERMS

Class I landfill: A landfill that accepts for disposal 20 tons or more of municipal solid waste daily (based on an annual average); or one that does not qualify as a Class II or Class III municipal solid waste landfill.

Class II landfill: A landfill that (1) accepts less than 20 tons daily of municipal solid waste (based on an annual average); (2) is located on a site where there is no evidence of groundwater pollution caused or contributed by the landfill; (3) is not connected by road to a Class I municipal solid waste landfill, or, if connected by road, is located more than 50 miles from a Class I municipal solid waste landfill; and (4) serves a community that experiences (for at least three months each year) an interruption in access to surface transportation, preventing access to a Class I landfill, or a community with no practicable waste management alternative.

Class III landfill: A landfill that is not connected by road to a Class I landfill or a landfill that is located at least 50 miles from a Class I landfill. Class III landfills can accept no more than an average of one ton daily of ash from incinerated municipal solid waste or less than five tons daily of municipal solid waste.

Transfer station: A facility for the temporary deposition of some wastes. Transfer stations are often used as places where local waste collection vehicles will deposit their waste cargo prior to loading into larger vehicles. These larger vehicles will transport the waste to the end point of disposal or treatment.

Waste Management Plan: A Waste Management Plan (WMP) is a completed WMP form, approved by the City for the purpose of compliance with Chapter 8.40 of the Brentwood Municipal Code, submitted by the applicant for any covered project. Prior to project start, the WMP shall identify the types of construction and demolition (C&D) debris materials that will be generated for disposal and recycling. A completed WMP contains actual weight or volume of the material disposed recycled receipts.

WASTE DISPOSAL FACILITIES

The vast majority (90%) of waste from the City of Lake Forest in 2017 (the latest year of information available) went to Frank R. Bowerman Sanitary Landfill[1]. The City of Lake Forest disposed of approximately 56,548 tons at this landfill. Other landfills that received relatively small amounts of waste from the City of Lake Forest in 2017 include:

- Antelope Valley Public Landfill (1 ton);
- Azusa Land Reclamation Co. Landfill (184 tons);
- El Sobrante Landfill (161 tons)
- McKittrick Waste Treatment Site (25 tons)
- Mid-Valley Sanitary Landfill (241 tons);
- Olinda Alpha Sanitary Landfill (223 tons);
- Prima Deshecha Sanitary Landfill (5,408 tons); and
- Simi Valley Landfill & Recycling Center (95 tons);

Frank R. Bowerman Sanitary Landfill

The Frank R. Bowerman Sanitary landfill is a Class III, municipal solid waste landfill. Opened in 1990 near Irvine, CA, it is one of the largest landfills in the state and the ninth largest in the United States. The property spans approximately 725 acres of Irvine hillside with 534 acres allocated for waste disposal. It is permitted for 11,500 tons per day (TPD) maximum with an 8,500 TPD annual average. Frank R. Bowerman Sanitary Landfill has a remaining capacity of 87,384,799 cubic yards. The City of Lake Forest contributed a total of 62,887 tons of waste in 2017, well below the remaining capacity of the landfill. In 2017, the City of Lake Forest disposed of a total of approximately 172 tons of waste per day, with approximately 155 tons per day of this total disposed at Frank R. Bowerman Sanitary Landfill. The landfill has enough projected capacity to serve residents and businesses until approximately 2053.

The landfill is also the site for the world's first landfill gas to liquid natural gas project. Opened in 2016, the Bowerman Power Plant is an award-winning, public-private partnership producing electricity to 14,700 homes, as of March 2018. It generates electric power by capturing landfill gas created by the millions of tons of waste buried at the landfill. A natural byproduct of solid waste decomposition, the gas contains high amounts of methane, a prevalent greenhouse gas and source of energy. Annual energy production at this site is approximately 154,500 megawatt-hours (MWH). The Power Plant has won awards from the Association of Energy Engineers (AEE), the American Society of Civil Engineers (ASCE), and the Solid Waste Association of North America (SWANA).

SOLID WASTE GENERATION RATES AND VOLUMES

The California Integrated Waste Management Act of 1989 (AB 939), requires each city or county's source reduction and recycling element to include an implementation schedule showing that a city or county must divert 50 percent of solid waste from landfill disposal or transformation on and after January 1, 2000. SB 1016, passed in 2008, required the 50 percent diversion requirement to

[1] Note: data provided by CalRecycle, based on information provided by County disposal reports.

be calculated in a per capita disposal rate equivalent. AB 341, passed in 2012, requires that California increase its diversion rate to 75% by 2020.

The California Department of Resources Recycling and Recovery (CalRecycle) tracks and monitors solid waste generation rates on a per capita basis. Per capita solid waste generation rates and total annual solid waste disposal volumes for the City of Lake Forest between 2011 and 2016 are shown in Table 3.15-7 below.

TABLE 3.15-7: SOLID WASTE GENERATION RATES IN THE CITY OF LAKE FOREST

YEAR	WASTE GENERATION RATES (POUNDS/PERSON/DAY)		TOTAL DISPOSAL TONNAGE (TONS/YEAR)
	PER RESIDENT	PER EMPLOYEE	
2011	4.6	10.3	65,028
2012	4.5	9.9	64,148
2013	4.4	9.6	64,771
2014	4.5	9.3	65,081
2015	4.4	9.1	64,856
2016	4.2	8.9	63,663

SOURCE: CALRECYCLE. 2018. JURISDICTION PER CAPITA DISPOSAL TRENDS. AVAILABLE AT: HTTP://WWW.CALRECYCLE.CA.GOV/LGCENTRAL/REPORTS/JURISDICTION/ REVIEWREPORTS.ASPX ACCESSED JULY 2018.

The City of Lake Forest has complied with State requirements to reduce the volume of solid waste through recycling and reuse of solid waste. As shown in Table 3.15-7, both the per capita waste generation rates and the total annual disposal tonnage in Lake Forest were at their lowest levels (during this period) in 2016 (the latest year of information available). The City's per capita disposal rates in 2016 were 4.2 and 8.9 pounds per person per day for residents and employees, respectively. The City's per capita disposal rate satisfies the target rate established by CalRecycle (of 10.6 pounds/person/day for residents and 24.2 pounds/person/day for employees).

HAZARDOUS WASTE DISPOSAL

Household hazardous waste are products that are flammable, corrosive, reactive or toxic. Examples of household hazardous waste include: automotive fluids, propane, paint and solvents, medical sharps, fertilizers, pool chemicals, cleaning products, pesticides, herbicides, and non-empty aerosol cans. Orange County operates year-round drop-off centers to collect household hazardous waste. The closest center to Lake Forest is in Irvine.

Separately, as of October 19, 2012, Assembly bill 1343 established the PaintCare Inc. program. The programs make proper paint disposal more convenient for the public by setting up hundreds of new paint drop-off sites at retailers throughout the state. The closest drop-off location is currently located in Lake Forest at Sherwin-Williams (22500 Muirlands Boulevard).

Electronic waste (e-Waste) is anything with a circuit board or battery. It is illegal to dispose of e-Waste in any of the regular carts. CR&R will legally dispose of these items for a nominal fee.

Universal wastes are hazardous wastes that contain mercury, lead, cadmium, copper, and other substances hazardous to human and environment health. In general, universal waste may not be discarded in solid waste landfills or placed in any of your automated carts. Residents and

businesses within Lake Forest can contact CC&R customer services to arrange a pick-up of E-waste or universal waste.

REGULATORY SETTING – SOLID WASTE

Federal

RESOURCE CONSERVATION AND RECOVERY ACT

The Resource Conservation and Recovery Act (RCRA) was enacted in 1976 to address the huge volumes of municipal and industrial solid waste generated nationwide. After several amendments, the Act as it stands today governs the management of solid and hazardous waste and underground storage tanks (USTs). RCRA, enacted in 1976, is an amendment to the Solid Waste Disposal Act of 1965. RCRA has been amended several times, most significantly by the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRA is a combination of the first solid waste statutes and all subsequent amendments. RCRA authorizes the Environmental Protection Agency (EPA) to regulate waste management activities. RCRA authorizes states to develop and enforce their own waste management programs, in lieu of the federal program, if a state's waste management program is substantially equivalent to, consistent with, and no less stringent than the Federal program.

State

CALIFORNIA INTEGRATED WASTE MANAGEMENT ACT (AB 939 AND SB 1322)

The California Integrated Waste Management Act of 1989 (AB 939 and SB 1322) requires every city and county to prepare a Source Reduction and Recycling Element to its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory State waste diversion goals of 25% by 1995 and 50% by 2000. The purpose of AB 939 and SB 1322 is to “reduce, recycle, and re-use solid waste generated in the state to the maximum extent feasible.” The term “integrated waste management” refers to the use of a variety of waste management practices to safely and effectively handle the municipal solid waste stream with the least adverse impact on human health and the environment. The Act has established a waste management hierarchy, as follows: Source Reduction; Recycling; Composting; Transformation; and Disposal.

CALIFORNIA INTEGRATED WASTE MANAGEMENT BOARD MODEL ORDINANCE

Subsequent to the Integrated Waste Management Act, additional legislation was passed to assist local jurisdictions in accomplishing the goals of AB 939. The California Solid Waste Re-use and Recycling Access Act of 1991 (§42900-42911 of the Public Resources Code) directs the California Integrated Waste Management Board (CIWMB) to draft a “model ordinance” relating to adequate areas for collecting and loading recyclable materials in development projects. The model ordinance requires that any new development project, for which an application is submitted on or after September 1, 1994, include “adequate, accessible, and convenient areas for collecting and loading recyclable materials.” For subdivisions of single family detached homes, recycling areas are required to serve only the needs of the homes within that subdivision.

CALIFORNIA MANDATORY COMMERCIAL RECYCLING LAW (AB 341)

Assembly Bill (AB) 341 directed CalRecycle to develop and adopt regulations for mandatory commercial recycling. CalRecycle initiated formal rulemaking with a 45-day comment period beginning Oct. 28, 2011. The final regulation was approved by the Office of Administrative Law on May 7, 2012. The purpose of AB 341 is to reduce GHG emissions by diverting commercial solid waste to recycling efforts and to expand the opportunity for additional recycling services and recycling manufacturing facilities in California.

Beginning on July 1, 2012, businesses have been required to recycle, and each jurisdiction has implemented programs that include education, outreach, and monitoring. Jurisdictions were required to start reporting on their 2012 Electronic Annual Report (due August 1, 2013) on their initial education, outreach, and monitoring efforts, and, if applicable, on any enforcement activities or exemptions implemented by the jurisdiction.

In addition to Mandatory Commercial Recycling, AB 341 sets a statewide goal for 75 percent disposal reduction by the year 2020. This is not written as a 75 percent diversion mandate for each jurisdiction. The 50 percent disposal reduction mandate still stands for cities, counties, and State agencies (including community colleges) under AB 939. CalRecycle continues to evaluate program implementation as it has in the past through the Annual Report review process for entities subject to either AB 939.

ASSEMBLY BILL 1826 MANDATORY COMMERCIAL ORGANICS RECYCLING

In October 2014 Governor Brown signed AB 1826, requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses, including multifamily residential dwellings that consist of five or more units (please note, however, that multi-family dwellings are not required to have a food waste diversion program). Organic waste (also referred to as organics) means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste. This law phases in the mandatory recycling of commercial organics over time, while also offering an exemption process for rural counties. In particular, the minimum threshold of organic waste generation by businesses decreases over time, which means an increasingly greater proportion of the commercial sector will be required to comply.

Starting on January 1, 2019, businesses that generate 4 cubic yards or more of commercial solid waste per week shall arrange for organic waste recycling services. By Summer/Fall 2021, if CalRecycle determines that the statewide disposal of organic waste in 2020 has not been reduced by 50 percent of the level of disposal during 2014, the organic recycling requirements on businesses will expand to cover businesses that generate 2 cubic yards or more of commercial solid waste per week. Additionally, certain exemptions may no longer be available if this target is not met.

SENATE BILL 1383 SHORT-LIVED CLIMATE POLLUTANTS: ORGANIC WASTE METHANE EMISSIONS REDUCTIONS

In September 2016, Governor Brown signed SB 1383, establishing methane emissions reduction targets in a statewide effort to reduce emissions of short-lived climate pollutants (SLCP) in various sectors of California's economy. The bill codifies the California Air Resources Board's Short-Lived Climate Pollutant Reduction Strategy, established pursuant to SB 605, in order to achieve reductions in the statewide emissions of short-lived climate pollutants. Actions to reduce short-lived climate pollutants are essential to address the many impacts of climate change on human health, especially in California's most at-risk communities, and on the environment.

As it pertains to solid waste, SB 1383 establishes targets to achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level by 2020 and a 75 percent reduction by 2025. The law grants CalRecycle the regulatory authority required to achieve the organic waste disposal reduction targets and establishes an additional target that not less than 20 percent of currently disposed edible food is recovered for human consumption by 2025.

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact on the environment associated with Utilities if it would:

- Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; and/or
- Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

IMPACTS AND MITIGATION MEASURES

Impact 3.15-6: General Plan implementation would comply with federal, state, and local management and reduction statutes and regulations related to solid waste, and would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals (Less than Significant)

Future development of projects as contemplated under the proposed General Plan may increase the population within the Planning Area to approximately 70,574 persons. As described above, the City of Lake Forest has achieved a disposal rate of 4.2 PPD per resident in 2016. Assuming these disposal rates remain constant throughout the life of the General Plan, the new growth under General Plan buildout would result in an increase of approximately 296,410.8 pounds per day of solid waste, which equals 148.2 tons per day or 54,093 tons of solid waste per year.

The City's projected increase in solid waste generation associated with future buildout of the proposed General Plan is well within the permitted capacity of the Frank R. Bowerman Sanitary Landfill. As noted previously, the vast majority (90%) of landfill disposed from the City of Lake Forest in 2017 (the latest year of information available) went to Frank R. Bowerman Sanitary Landfill.[2] Other landfills that received relatively small amounts of waste from the City of Lake Forest in 2017 include:

- Antelope Valley Public Landfill (1 ton);
- Azusa Land Reclamation Co. Landfill (184 tons);
- El Sobrante Landfill (161 tons)
- McKittrick Waste Treatment Site (25 tons)
- Mid-Valley Sanitary Landfill (241 tons);
- Olinda Alpha Sanitary Landfill (223 tons);
- Prima Deshecha Sanitary Landfill (5,408 tons); and
- Simi Valley Landfill & Recycling Center (95 tons);

Frank R. Bowerman Sanitary Landfill has a remaining capacity of 87,384,799 cubic yards, and has a current maximum permitted throughput of 11,500 tons per day, and currently receives an average of approximately 8,500 tons per day. This landfill has an estimated cease operation date of December 31, 2058. This is a **less than significant** impact and no mitigation is required.

Future projects within the Planning Area would be required to comply with applicable state and local requirements including those pertaining to solid waste, construction waste diversion, and recycling. While there is adequate permitted landfill capacity to accommodate future growth, the proposed General Plan includes actions to further reduce the project's impact on solid waste services, as identified below. The General Plan would not exceed the permitted capacity of the landfill serving the city, and the General Plan complies with regulations related to solid waste.

GENERAL PLAN ACTIONS THAT MINIMIZE POTENTIAL IMPACTS

RR-6a: Regularly monitory the level of service provided by waste and recycling collection contractors to ensure that service levels meet the terms of the contract.

RR-6b: Include standard language in requests for services and in City agreements requiring contractors to use best management practices to maximize diversion of waste from the landfill in order to meet the City's specified diversion rates.

RR-6c: Encourage recycling, reuse, and appropriate disposal of hazardous materials, including the following:

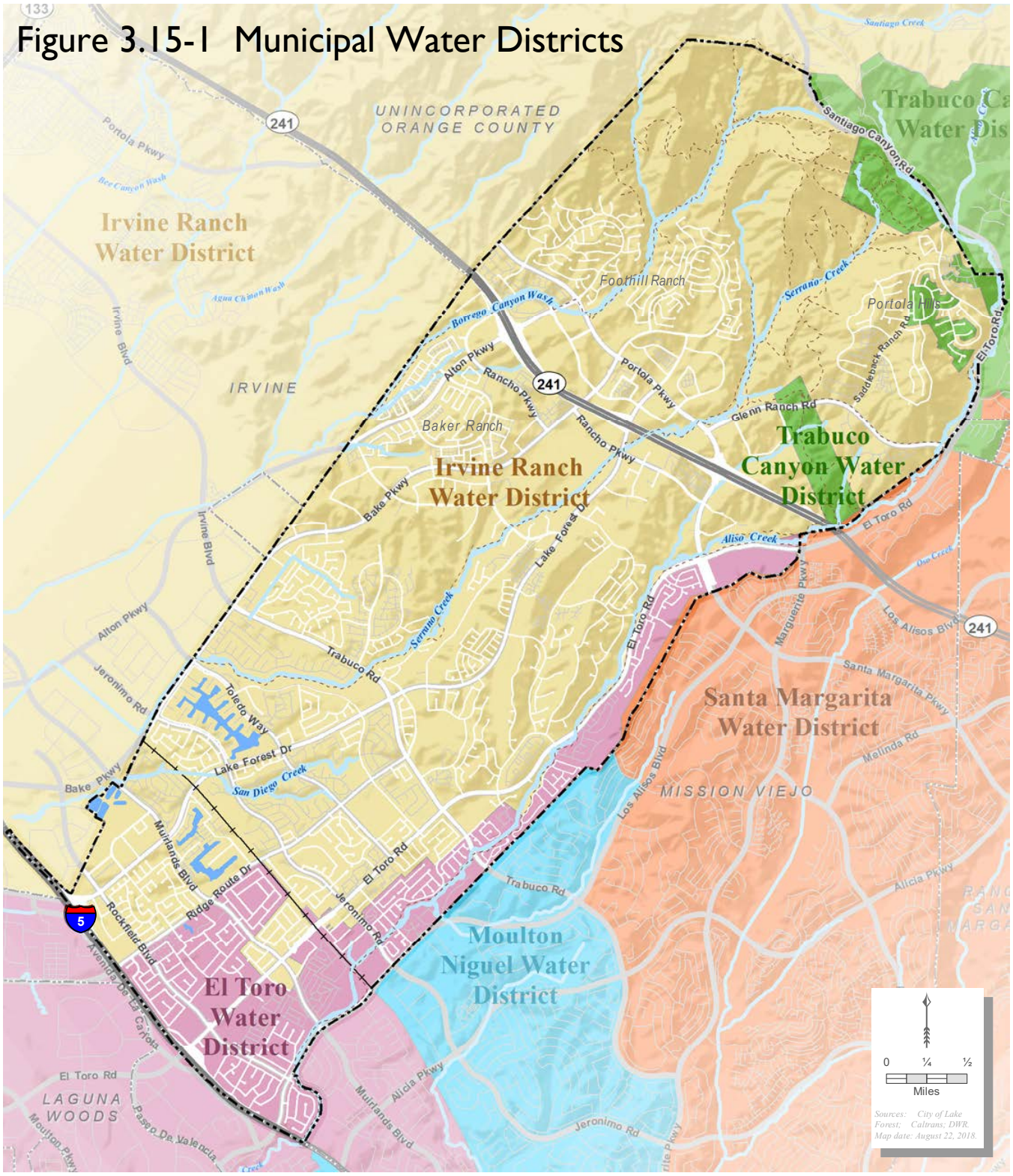
- *Increased participation in single family and multifamily residential curbside recycling programs;*
- *Increased participation in commercial and industrial recycling programs for paper, cardboard, and plastics;*

[2] Note: data provided by CalRecycle, based on information provided by County disposal reports.

- *Reduce yard and landscaping waste through methods such as composting, grass recycling, and using resource efficient landscaping techniques; and*

RR-6d: Encourage local businesses to provide electronic waste (e-waste) drop-off services and encourage residents and businesses to properly dispose of, or recycle, e-waste.

Figure 3.15-1 Municipal Water Districts



Legend

- El Toro Water District
- Irvine Ranch Water District
- Moulton Niguel Water District
- Santa Margarita Water District
- Trabuco Canyon Water District

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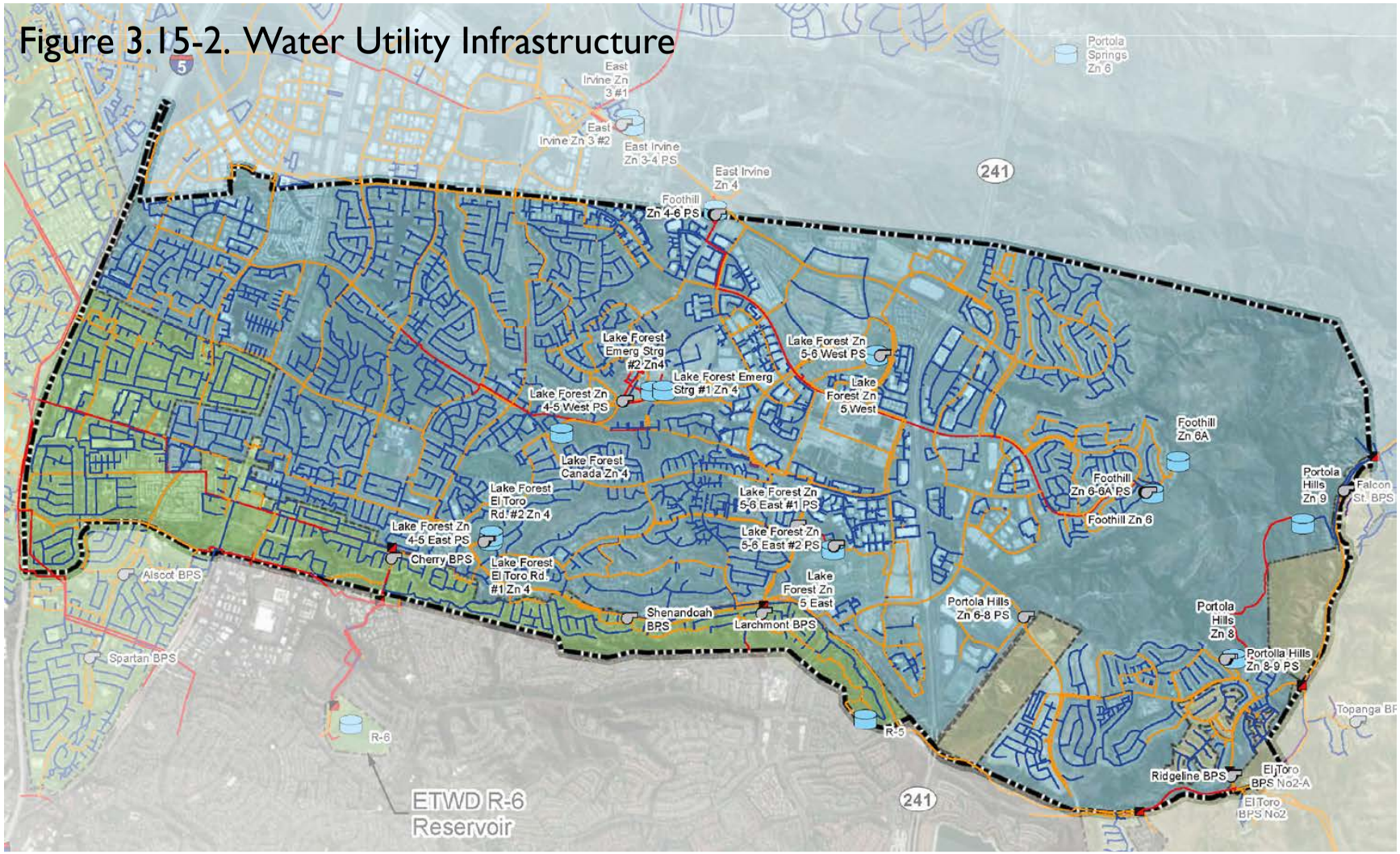
Figure 3.15-2. Water Utility Infrastructure



Legend

Water Infrastructure

Water Mains by Diameter

- No Data
- 2-8 inches
- 10-20 inches
- 21+ inches

- Pump Station
- Interconnection
- Reservoir

Boundaries

- City of Lake Forest
- El Toro Water District Boundary
- Irvine Ranch Water District Boundary
- Trabuco Canyon Water District Boundary

0 ¼ ½
Miles

Sources: West Yost Associates 6/26/2018. Map date: August 22, 2018.

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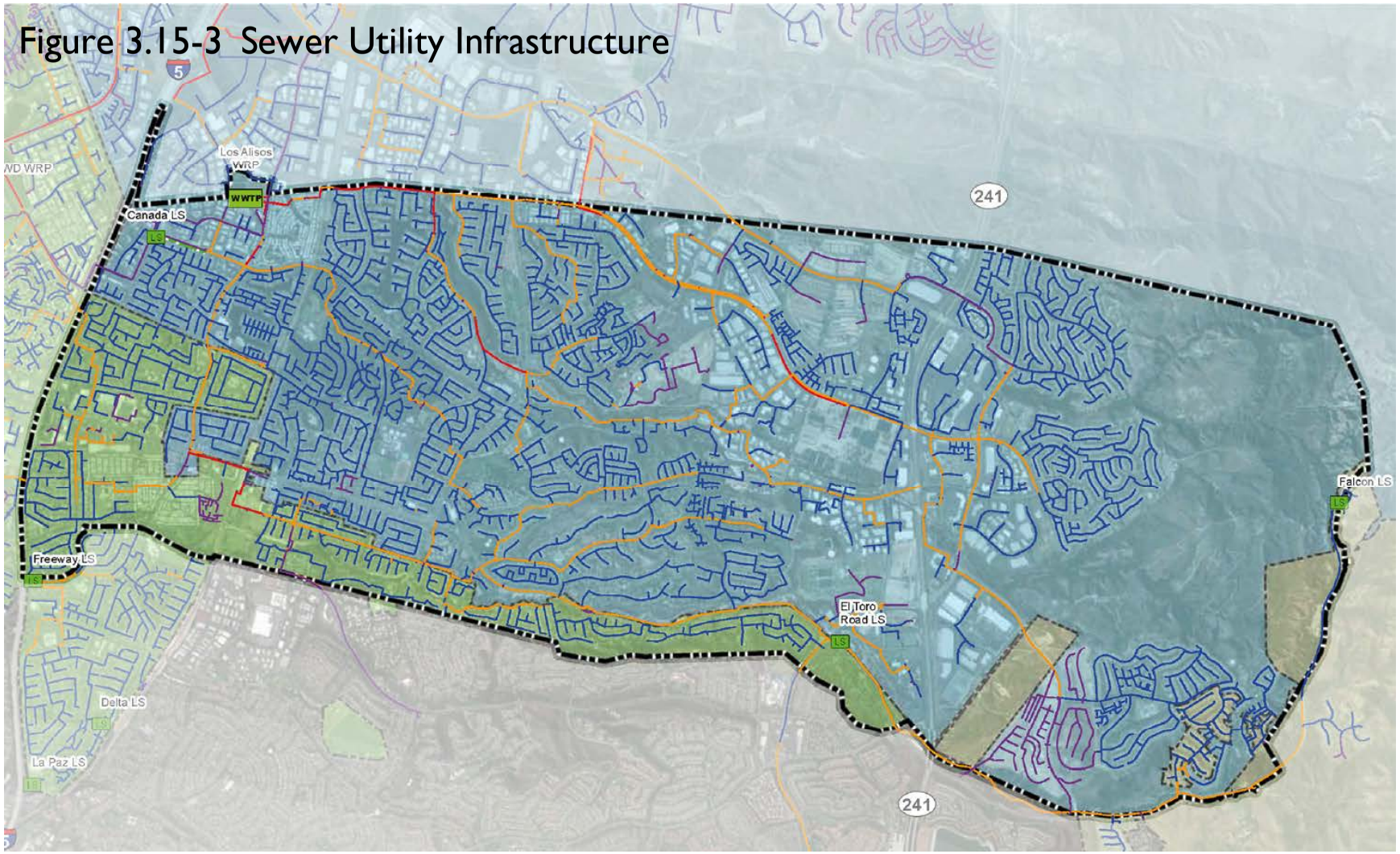
Figure 3.15-3 Sewer Utility Infrastructure



Legend

Sewer Infrastructure

Sewer Mains by Diameter

- No Data
- 2-8 inches
- 10-18 inches
- 21+ inches

- LS Sewer Lift Station
- WWTP Wastewater Treatment Plant

Boundaries

- City of Lake Forest
- El Toro Water District Boundary
- Irvine Ranch Water District Boundary
- Trabuco Canyon Water District Boundary

0 ¼ ½
Miles

Sources: West Yost Associates 6/26/2018. Map date: August 22, 2018.

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This section provides a background discussion of the hazards associated with wildfires in the City of Lake Forest. The discussion of fire suppression resources is located within Chapter 3.13, Public Services and Recreation, of this report.

No comments were received during the NOP comment period regrading this environmental topic.

3.16.1 ENVIRONMENTAL SETTING

FIRE HAZARD SEVERITY ZONES

The state has charged CalFire with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas. In addition, CalFire must recommend Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas. The FHSZ maps are used by the State Fire Marshall as a basis for the adoption of applicable building code standards. The Planning Area includes only Local Responsibility Areas with State Responsibility Areas to the north just outside city boundaries. Included in Chapter 3.8, Hazards and Hazardous Materials, Figure 3.8-1 shows Fire Hazard Severity Zones within Lake Forest, and Figure 3.8-2 shows the corresponding fire threat to people.

Local Responsibility Areas

Local Responsibility Areas (LRAs) cover all of the City of Lake Forest. The City of Lake Forest is served by the Orange County Fire Authority. Most of the Foothill Ranch and Portola Hills area is within the very high Fire Hazard Severity Zone.

State Responsibility Areas

State Responsibility Areas (SRA) are found north of the City in unincorporated areas of the county. Some of these areas are within the Very High Fire Hazard Severity Zone.

Fire Threat to People

Most of the area north of Trabuco is in an area that is considered either very high or extremely high Fire Threat to People.

IDENTIFYING FIRE HAZARDS

Fuel Rank

Fuel rank is a ranking system developed by CalFire that incorporates four wildfire factors: fuel model, slope, ladder index, and crown index.

The U.S. Forest Service has developed a series of fuel models, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior. In addition to fuel characteristics, slope is an important contributor to fire hazard levels. A surface ranking system has been developed by CalFire, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10%, 11-25%, 26-40%, 41-55%, 56-75% and >75%. The combined fuel model and slope data are organized into three categories, referred to as surface

rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.

The ladder index is a reflection of the distance from the ground to the lowest leafy vegetation for tree and plant species. The crown index is a reflection of the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index, and crown index for a given area are combined in order to establish a fuel rank of medium, high, or very high. Fuel rank is used by CalFire to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

The fuel rank data are used by CalFire to delineate fire threat based on a system of ordinal ranking. Thus, the Fire Threat model creates discrete regions, which reflect fire probability and predicted fire behavior. The four classes of fire threat range from moderate to extreme.

LOCAL FIRE PROGRAMS

The Orange County Fire Authority operates a number of programs that include information on cooking fires, disaster preparedness, drowning prevention, fire safety, smoke alarm and home escape plans, the Ready, Set, Go! Wildfire Emergency Preparedness Action Plan, the Fire FRIENDS program, and information current wildfire danger. In 2017, the OCFA participated in a total of 107 community outreach and educational events as part of its mission to enhance the public safety through education.

Fire FRIENDS

Fire FRIENDS is a collaboration of community-based partners joining together with the common goal of reducing the number of deaths, burn injuries and property destruction caused by juvenile firesetting. The OCFA provides fire safety education and intervention to children with an interest in fire or explosives, and to those who have been involved in a firesetting incident. In situations where the behaviors or concerns appear to be more serious, the Fire FRIENDS program offers a referral for a free confidential behavioral health evaluation with an experienced behavioral health professional.

Ready, Set, Go! Wildfire Emergency Preparedness

The “Ready, Set, Go!” Action Plan, available to all City of Lake Forest residents on the Fire Department’s website, is an easy to understand guide for how to make your home resistant to wildfires as well as preparing your family to leave early and safely. This process is called “Ready, Set, Go!” (RSG). The publication was prepared by the International Association of Fire Chief’s RSG! Program and the U.S.D.A Forest Service, U.S. Department of the Interior, and the U.S. Fire Administration, in collaboration with the Lake Forest Fire Department.

The Action Plan describes the risks and responsibilities associated with living in a Wildland Urban Interface and Ember Zone, which is generally the area where residential development meets natural open space. Residents in these areas and on the wildland boundary should assist

firefighters by providing "defensible space" around their home, effectively creating a buffer zone by removing weeds, brush, and other vegetation. The Action Plan also provides direction on how to make your home more fire resistant by selecting certain materials and design features that protect the home against fire and assist firefighters with defending the structure. Information is included to help people prepare their own Action Guide, including a checklist for getting ready, a checklist to ensure you're prepared to leave, and a checklist of how you should respond when it's time to leave.

3.16.2 REGULATORY SETTING

FEDERAL

FY 2001 Appropriations Act

Title IV of the Appropriations Act required the identification of "Urban Wildland Interface Communities in the Vicinity of Federal Lands that are at High Risk from Wildfire" by the U.S. Departments of the Interior and Agriculture.

Disaster Mitigation Act (2000)

Section 104 of the Disaster Mitigation Act of 2000 (Public Law 106-390) enacted Section 322, Mitigation Planning of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which created incentives for state and local entities to coordinate hazard mitigation planning and implementation efforts, and is an important source of funding for fuels mitigation efforts through hazard mitigation grants.

National Incident Management System (NIMS)

The City adopted NIMS, which provides a systematic, proactive approach to guide government agencies, nongovernmental organizations, and the private sector to work together to prevent, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment. NIMS improves the City's ability to prepare for and respond to potential incidents and hazard scenarios.

National Fire Plan (NFP) 2000

The summer of 2000 marked a historic milestone in wildland fire records for the United States. Dry conditions (across the western United States), led to destructive wildfire events on an estimated 7.2 million acres, nearly double the 10-year average. Costs in damages including fire suppression activities were approximately 2.1 billion dollars. Congressional direction called for substantial new appropriations for wildland fire management. This resulted in action plans, interagency strategies, and the Western Governor's Association's "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment - A 10-Year Comprehensive Strategy - Implementation Plan", which collectively became known as the National Fire Plan. This plan places a priority on collaborative work within communities to reduce their risk from large-scale wildfires.

Healthy Forest Initiative (HFI) 2002/Healthy Forest Restoration ACT (HFRA) 2003

In August 2002, the Healthy Forests Initiative (HFI) was launched with the intent to reduce the severe wildfires risks that threaten people, communities, and the environment. Congress then passed the Healthy Forests Restoration Act (HFRA) on December 3, 2003 to provide the additional administrative tools needed to implement the HFI. The HFRA strengthened efforts to restore healthy forest conditions near communities by authorizing measures such as expedited environmental assessments for hazardous fuels projects on federal land. This Act emphasized the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects and places priority on fuel treatments identified by communities themselves in their Community Wildfire Protection Plans.

Department of the Interior Department Manual Part 620

Wildland Fire Management. Part 620 of the Department of the Interior Departmental Manual pertains to wildland fire management policies, with the goal of providing an integrated approach to wildland fire management. The guiding principles of the plan emphasize the need for public health and safety considerations, risk management protocols, inter-agency collaboration, and economic feasibility of wildfire management practices, as well as the ecological role of wildfires.

STATE

California Strategic Fire Plan

This statewide plan is a strategic document, which guides fire policy for much of California. The plan is aimed at reducing wildfire risk through pre-fire mitigation efforts tailored to local areas through assessments of fuels, hazards, and risks.

California State Multi-Hazard Mitigation Plan

The purpose of the State Multi-Hazard Mitigation Plan (SHMP) is to significantly reduce deaths, injuries, and other losses attributed to natural- and human-caused hazards in California. The SHMP provides guidance for hazard mitigation activities emphasizing partnerships among local, state, and federal agencies as well as the private sector.

California Government Code

California Government Code Section 65302.5 requires the State Board of Forestry and Fire Protection to provide recommendations for a local jurisdiction's General Plan fire safety element when the jurisdiction amends its general plan. While not a direct and binding fire prevention requirement for individuals, general plans that adopt the Board's recommendations will include goals and policies that provide for contemporary fire prevention standards for the jurisdiction. While the State Board of Forestry and Fire Protection has not specifically commented on the Proposed General Plan at the time that this EIR was written, the Proposed General Plan has been developed to include best practices to ensure contemporary fire preventation standards, as described in greater detail under the impact discussions below.

California Government Code Section 51175 defines Very High Fire Hazard Severity Zones and designates lands considered by the State to be a very high fire hazard.

California Government Code Section 51189 directs the Office of the State Fire Marshal to create building standards for wildland fire resistance. The code includes measures that increase the likelihood of a structure withstanding intrusion by fire (such as building design and construction requirements that use fire-resistant building materials) and provides protection of structure projections (such as porches, decks, balconies and eaves), and structure openings (such as attics, eave vents, and windows).

California Public Resource Code

The State's Fire Safe Regulations are set forth in Public Resources Code §4290, which include the establishment of SRAs.

Public Resources Code §4291 sets forth defensible space requirements, which are applicable to anyone that …owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material (§4291(a)).

Public Resources Code § 4292-4296 and 14 CCR 1256: Fire Prevention for Electrical Utilities address the vegetation clearance standards for electrical utilities. They include the standards for clearing around energy lines and conductors such as power-line hardware and power poles. These regulations are critical to wildland fire safety because of the substantial number of power lines in wildlands, the historic source of fire ignitions associated with power lines, and the extensive damage that results from power line caused wildfires in severe wind conditions.

Assembly Bill 337

Per AB 337, local fire prevention authorities and the California Department of Forestry and Fire Protection (CalFire) are required to identify "Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas (LRA). Standards related to brush clearance and the use of fire resistant materials in fire hazard severity zones are also established.

Uniform Fire Code

The Uniform Fire Code (UFC) establishes standards related to the design, construction, and maintenance of buildings. The standards set forth in the UFC range from designing for access by firefighters and equipment and minimum requirements for automatic sprinklers and fire hydrants to the appropriate storage and use of combustible materials.

CA Code of Regulations Title 8

In accordance with CCR, Title 8, §1270 and §6773 (Fire Prevention and Fire Protection and Fire Equipment), the Occupational Safety and Health Administration (Cal OSHA) establishes fire suppression service standards. The standards range from fire hose size requirements to the design of emergency access roads.

CA Code of Regulations Title 14 (Natural Resources)

Division 1.5 (Department of Forestry and Fire Protection), Title 14 of the CCR establishes a variety of wildfire preparedness, prevention, and response regulations.

CA Code of Regulations Title 19 (Public Safety)

Title 19 of the CCR establishes a variety of emergency fire response, fire prevention, and construction and construction materials standards.

CA Code of Regulations Title 24 (CA Building Standards Code)

The California Fire Code is set forth in Part 9 of the Building Standards Code. The CA Fire Code contains fire-safety building standards referenced in other parts of Title 24.

CA Health and Safety Code and UBC Section 13000 et seq.

State fire regulations are set forth in §13000 et seq. of the California Health and Safety Code, which is divided into "Fires and Fire Protection" and "Buildings Used by the Public." The regulations provide for the enforcement of the UBC and mandate the abatement of fire hazards.

The code establishes broadly applicable regulations, such as standards for buildings and fire protection devices, in addition to regulations for specific land uses, such as childcare facilities and high-rise structures.

CA Health and Safety Code Division 11 (Explosives)

Division 11 of the Health and Safety Code establishes regulations related to a variety of explosive substances and devices, including high explosives and fireworks. Section 12000 et seq. establishes regulations related to explosives and explosive devices, including permitting, handling, storage, and transport (in quantities greater than 1,000 pounds).

California Senate Bill No. 1241.

California Senate Bill No. 1241 requires that the Safety Element component of city or county general plans to incorporate fire risk related to SRAs and Very High Fire Hazard Severity Zones.

CA Vehicles Code 31600 (Transportation of Explosives)

Establishes requirements related to the transportation of explosives in quantities greater than 1,000 pounds, including licensing and route identification.

LOCAL

City of Lake Forest Municipal Code

Title 6 - Health and Sanitation (6.16 Hazardous Materials); this section discusses hazardous materials including disclosure to the Orange County Fire Department.

Title 7 - Subdivisions (7.08.145 Fire Protection); this section discusses the requirements for subdivisions in high or extremely high hazard areas including providing appropriate fire protection

by means of fire breaks, fuel modification programs, access roads, sufficient water supply, landscaping, and open spaces.

Title 8 - Buildings and Construction (8.24 Fire Code); this section includes the adoption of the 2016 California Fire code and the adoption of additional amendments.

Title 9 - Planning and Zoning (9.144.070.7 Public display of fireworks); this section covers public firework displays including requiring permits from the Orange County Fire Authority or Fire Chief.

Title 11 - Peace and Safety (11.56 Fire Alarm Systems); this section covers regulations relating to fire alarm systems.

3.16.3 IMPACTS AND MITIGATION MEASURES

THRESHOLDS OF SIGNIFICANCE

Consistent with Appendix G of the CEQA Guidelines, the proposed project will have a significant impact related to wildfires if it will:

- Substantially impair an adopted emergency response plan or emergency evacuation plan.
- Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

IMPACTS AND MITIGATION MEASURES

Impact 3.16-1: General Plan implementation could substantially impair an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

The General Plan would allow a variety of new development, including residential, commercial, industrial, and public service projects, which would result in increased jobs and population in Lake Forest. Road and infrastructure improvements would occur to accommodate the new growth as further discussed in Chapter 3.14 (Transportation). Future projects are not anticipated to remove or impede evacuation routes, and the General Plan does not include land uses, policies, or other components that conflict with adopted emergency response or evacuation plans. The City is a member of the Orange County Operation Area emergency response organization and the Orange County Emergency Management Organization. Both of these entities provide mutual aid to communities via the Orange County Sheriff's Department, Orange County Fire Authority and the State of California Office of Emergency Services.

The proposed Lake Forest General Plan is a policy document that does not include any site specific designs or proposals and does not propose any entitlements for development that would have the potential to impair or conflict with an adopted emergency response or evacuation plan. Any future development projects that would implement the General Plan, including buildout of uses contemplated under the proposed Land Use Map, would be subject to all applicable City regulations, reviews, and requirements pertaining to emergency response, emergency access, and maintaining emergency evacuation routes, as well as further CEQA analysis of project-specific impacts.

The General Plan ensures that the City's emergency access routes, emergency contact lists, and public information regarding designated facilities and routes are regularly reviewed to ensure that up to date information is available to the City and the public in the event of an emergency. Important new critical facilities would also be located to ensure resiliency and functionality in the event of a natural disaster. Implementation of the General Plan would have a **less than significant** impact with regard to this issue.

GENERAL PLAN POLICIES AND ACTIONS THAT MINIMIZE POTENTIAL IMPACTS

POLICIES

PS-4.5: Emergency Response. Work with the Orange County Fire Authority and other responding agencies to ensure that emergency personnel respond safely and effectively to a hazardous materials incident in the city.

PS-5.1: Critical Facilities. Coordinate with service providers to ensure the resilience of critical facilities, lifeline services, and infrastructure, and plan for the use of critical facilities during post-disaster response and recovery.

PS-5.2: Emergency Preparedness Plans. Maintain an updated Emergency Operations Plan specific to Lake Forest.

PS-5.3: Local Coordination. Coordinate with local key actors (officials, schools, businesses, and organizations) within the community to make them aware of their role in the emergency plan and the necessary requirements in case of emergency.

PS-5.4: Automatic and Mutual Aid. Continue to participate in automatic and mutual aid agreements with adjacent service providers to ensure efficient and adequate resources, facilities, and support services during and after emergencies.

PS-5.5: Communications. Evaluate the potential to utilize a comprehensive emergency communication system that allows for efficient connection in case of emergency.

PS-5.6: Emergency Evacuation Routes and Access. Work with the Orange County Fire Authority and the Orange County Sherriff's Department to maintain, update, and regularly exercise emergency access, protocols, and evacuation routes to assess their effectiveness.

PS-5.7: Emergency Shelters. Periodically coordinate with emergency shelter providers to ensure that necessary equipment supplies are available in case of emergency.

PS-5.8: Community Training Programs. Continue to support community-based emergency training programs as a valuable asset to the community.

PS-5.9: Public Awareness. Prepare residents for emergency situations by making emergency strategies, including evacuation routes, publicly-known and easily accessible.

PS-5.10: School Safety. Coordinate with local schools related to their programs and practices regarding emergency preparedness.

ACTIONS

PF-8a: The Orange County Fire Authority and City Engineer will review proposed development project and street networks to evaluate the accessibility for fire engines and other emergency response functions.

Impact 3.16-2: General Plan implementation could, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. (Less than Significant)

Wildfires generally ignite structures in several ways: burning embers landing on the structure or flammable material next to the structure; direct flame contact; and radiant heat from fire close to the structure (IBHS 2018). Embers are the most important cause of home ignition. Embers ignite structures by entering through attic vents, igniting flammable materials around the home (litter in the roof gutter, wood stacks, or wood fencing), or finding their way under roofing materials (California Chaparral Institute 2018).

A wildland urban interface (WUI) is any area where structures and other human developments meet or intermingle with wildland vegetative fuels—the shrubs, trees and grasses. These plants and wildland areas have evolved over time to burn. Developments in the wildland-urban interface exacerbate fire occurrence and fire spread in several ways:

- Increased numbers of human-caused wildfires.
- Wildfires become harder to fight.
- Firefighting resources are diverted from containing the wildfire to protecting lives and homes.
- Letting natural fires burn becomes impossible, leading to build-up of fuel and increasing wildfire hazard further. (Radeloff, Volker, et al., 2018)
- Increased fire frequency tends to eliminate native shrubs, which are replaced by weedy, highly flammable annual grasslands. (USGS 2012)

Air Pollution from Wildfire Smoke is made up of a complex mixture of gases and fine particles produced when wood and other organic materials burn. The biggest health threat from smoke is from fine particles. These microscopic particles can penetrate deep into the lungs. They can cause a range of health problems, from burning eyes and a runny nose to aggravated chronic heart and lung diseases. Some populations are more sensitive than others to smoke—for instance, people

with heart or lung diseases, the elderly, children, people with diabetes, and pregnant women (CARB 2005, and Airnow 2018).

The rate of wildfire spread due to slope and wind is generally proportional to the grade upslope and wind speed and associated location downwind.

The City of Lake Forest comprises a transition zone between an elevated coastal terrace and the Santa Ana Mountains. The western portion of the City, on the coastal terrace, is about 200 feet amsl. The land becomes progressively higher and steeper to the east, eventually reaching elevations above 1,500 feet amsl along the ridgeline of the Santa Ana Mountains. Wildfire hazards in southern California are at their greatest when Santa Ana winds—hot, dry, northeasterly winds—are blowing, usually in autumn.

Fire threat determination is a combination of two factors: 1) fire frequency, or the likelihood of a given area burning, and 2) potential fire behavior (hazard). These two factors are combined to create four threat classes ranging from moderate to extreme. Fire threat can be used to estimate the potential for impacts on various assets and values susceptible to fire. Impacts are more likely to occur and/or be of increased severity for the higher threat classes. As shown on Figure 3.9-2, most of the area within Lake Forest northeast of Trabuco Road is in an area that is considered either very high or extremely high fire threat to people while areas to the southwest are generally considered to have a moderate threat to people.

Development under the General Plan would allow development to place people and/or structures in currently developed areas that are identifies as having a significant risk of wildland fires. Any future projects contemplated under the General Plan would be required to comply with the provisions of Federal, State, and local requirements related to wildland fire hazards, including State fire safety regulations associated with wildland-urban interfaces, fire-safe building standards, and defensible space requirements as part of the project's approval process. As future development and infrastructure projects are considered by the City, each project would be evaluated for potential impacts, specific to that project, associated with wildland fire hazards as required under CEQA. The General Plan and General Plan Land Use Map do not designate any new urban and/or residential uses in the areas of the City designated as Very High FHSZs. The majority of the areas within Lake Forest designated as a Very High FHSZ are designated for open space uses, which would preclude new development. Portions of Foothill Ranch and Portola Hills are located within the Very High FHSZ; however, these projects are fully entitled, mostly built-out, and the updated General Plan would not allow or otherwise facilitate increased development potential within these areas.

The Lake Forest General Plan is a policy document that does not include site specific designs or proposals and does not propose any entitlements for development that would have the potential to expose occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Any future development projects that would implement the General Plan including buildout of uses allowed under the proposed Land Use Map would be subject to all applicable City regulations, reviews, and requirements pertaining to emergency response, emergency access, and maintaining emergency evacuation routes, as well as being subject to all applicable building code

and fire code requirements as well as further CEQA analysis of project-specific impacts for individual development projects.

The City of Lake Forest Municipal Code Title 7 – Subdivisions (7.08.145 Fire Protection) discusses the requirements for subdivisions in high or extremely high hazard areas including providing appropriate fire protection by means of fire breaks, fuel modification programs, access roads, sufficient water supply, landscaping, and open spaces. Title 8- Buildings and Construction (8.24 Fire Code) includes the adoption of the 2016 California Fire code and the adoption of additional amendments. Title 11- Peace and Safety (11.56 Fire Alarm Systems) covers regulations relating to fire alarm systems. Additionally, development allowed under the General Plan would also be required to comply with OCFA VHFSHZ guidelines, which ensures that development design will comply with the applicable provisions of the Uniform Fire Code (UFC) as well as locally adopted ordinances enforced by the OCFA.

Nothing in the General Plan will substantially alter the slope, prevailing winds, or other factors that would increase exposure to Lake Forest residents, employees or visitors to increased pollutant concentrations from wildfire or result in the uncontrollable spread of a wildfire. General Plan implementation would not exacerbate wildfire risks in VHFHSZs; therefore, these impacts would be **less than significant**. Because impacts are less than significant, no mitigation is required. Nonetheless, General Pan Policies related to minimizing wildfire risk are included below.

GENERAL PLAN POLICIES THAT MINIMIZE POTENTIAL IMPACTS

PS-2.1: Building Fire Codes. Require that all buildings and facilities within Lake Forest comply with local, state, and federal regulatory standards such as the California Building and Fire Codes as well as other applicable fire safety standards.

PS-2.2: Fire Protection Services. Coordinate with the Orange County Fire Authority and CalFire as it protects the safety and security of the Lake Forest community.

PS-2.3: Fire Hazard Identification. Maintain and regularly update the City's fire hazard overlay map for changes in fire hazard severity districts consistent with changes in hazard designations by CAL FIRE.

PS-2.4: Very High Fire Hazard Zone. Require that all development in Very High Fire Hazard Zones meet Very High Fire Hazard Zone standards as designated by City Ordinance.

PS-2.5: Urban Fire Risks. Work with the City's fire service provider to maintain an ongoing fire inspection program to reduce fire hazards associated with multifamily development, critical facilities, public assembly facilities, industrial buildings, and nonresidential buildings.

PS-2.6: Grant Funding. Seek grant funding, on our own and in collaboration with regional partners, to mitigate potential wildfire threats to the community and to implement special training workshops and projects related to defensible space and fuel reduction practices.

PS-2.7: Regional Coordination. Coordinate with the County of Orange, neighboring cities, and other fire protection agencies to reduce the potential for wildfire hazards in the Saddleback Valley.

PS-2.8: Interagency Support. Participate in the mutual aid system and automatic aid agreements to back up and supplement capabilities to respond to emergencies.

PS-2.9: Educational Programs. Work with the Orange County Fire Authority to disseminate educational programs on fire safety measures and fire hazard risks for residents in fire hazard severity zones.

PS-5.6: Emergency Evacuation Routes and Access. Work with the Orange County Fire Authority and the Orange County Sherriff's Department to maintain, update, and regularly exercise emergency access, protocols, and evacuation routes to assess their effectiveness.

PS-5.9: Public Awareness. Prepare residents for emergency situations by making emergency strategies, including evacuation routes, publicly-known and easily accessible.

PF-3.3: Water Pressure. Coordinate with local water districts and Orange County Fire Authority to encourage water pressures that remain high enough throughout all areas of the community to provided needed water capacity for fire protection.

PF-8.1: Police and Fire Department Facilities. Encourage the Orange County Fire Authority and the Orange County Sheriff's Department to maintain adequate staff and equipment to provide efficient, high quality, and responsive fire protection and emergency medical services to existing and future growth in Lake Forest.

PF-8.2: Emergency Response Times. Work cooperatively with the Orange County Fire Authority, Orange County Sheriff's Department, and providers of emergency medical services to ensure acceptable response times in accordance with provider standards.

PF-8.3: Department Consultation. Promote coordination between the City of Lake Forest and Police and Fire services during the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.

PF-8.5: Community Awareness. Support the Orange County Fire Authority and the Orange County Sheriff's Department in promoting community awareness regarding crime through public service organizations, and the establishment of citizen involved programs and patrols.

PF-8.7: Technology. Encourage and support efforts to improve police, fire, and emergency medical services through improved use of modern technology and industry best practices.

Impact 3.16-3: Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. (Less than Significant)

Development in or near fire hazard severity zones would require the construction and installation of infrastructure, including roads water and sewer and power lines. Development of such infrastructure may increase wildfire risks in the affected areas. Infrastructure required to serve development allowed under the General Plan would generally be located in and along established City roadways and would be located in areas that are already urbanized and are currently served

by infrastructure. As such, implementation of the General Plan would not exacerbate wildfire risks.

The eastern portions of the Plan Area is within the VHFHSZ, and the majority of the developable lands in those portions of the Plan Area have already been developed with residential, commercial, and industrial neighborhood uses and are served by roads, power lines, water sources, and other utilities. A large portion of the undeveloped eastern portion of the city within a VHFHSZ is designated as Regional Park and Open Space lands that generally do not require significant amounts of development and associated infrastructure improvements. However, portions of the undeveloped eastern planning area (located within a VHFSZ) may also see additional residential and commercial developments that would require the extension and maintenance of associated infrastructure beyond existing conditions.

The City of Lake Forest Municipal Code Title 7 – Subdivisions (7.08.145 Fire Protection) discusses the requirements for subdivisions in high or extremely high hazard areas including providing appropriate fire protection by means of fire breaks, fuel modification programs, access roads, sufficient water supply, landscaping, and open spaces. Title 8- Buildings and Construction (8.24 Fire Code) includes the adoption of the 2016 California Fire code and the adoption of additional amendments. Title 11- Peace and Safety (11.56 Fire Alarm Systems) covers regulations relating to fire alarm systems.

General Order (GO) 95 of the California Public Utilities Commission (CPUC) regulates all aspects of design, construction, and O&M of overhead electrical power lines and fire safety hazards for utilities subject to its jurisdiction. GO 165 imposes inspection requirements for transmission and distribution lines, and GO 166 requires emergency response procedures to respond to electric system failures, major outages, or hazards posed by damage to electric utility facilities. Rule 11 enables electric utilities to suspend customer service when minimum vegetation clearance requirements are not met. On February 5, 2014, the CPUC adopted its Decision Adopting Regulations to Reduce the Fire Hazards Associated with Overhead Electric Utility Facilities and Aerial Communications Facilities. (Decision 14-02-015.) In addition to updating various GO 95 requirements and ordering further study, the decision called for creation by the CPUC of a High Fire-Threat District (HFTD) map identifying zones of high hazard, elevated risk and extreme risk for destructive utility-associated wildfires.

On December 21, 2017, the CPUC issued its Decision Adopting Regulations to Enhance Fire Safety in the High Fire Threat District, adding statewide HFTD map requirements to GO 95 and enhancing GO 95's fire safety regulations within HFTD areas. (Decision 17-12-024.) As described in the CPUCs High Fire-Threat District (HFTD) maps the City of Lake Forest is within Tier 2 – Elevated, and Tier 3 – Extreme risk for destructive utility-associated wildfires.

Development allowed under the General Plan would be required to comply with OCFA VHFHSZ guidelines, which ensures that development design will comply with the applicable provisions of the California Building Code (CBC) and Uniform Fire Code (UFC), as well as locally adopted ordinances enforced by the OCFA. Future developments utility infrastructure would also be subject to the requirements established in the additional Public Resources Code including: PRC Section

4292, which requires clearing of flammable fuels for a minimum 10-foot radius from the outer circumference of poles and towers; and PRC Section 4293, which sets basic requirements for clearances around electrical conductors. Furthermore, the future projects would be required to meet vegetation clearance requirements outlined in Title 14, Section 1104.1(d) of the California Code of Regulations for single overhead facilities, and in CPUC General Order 95 requirements for overhead utility lines in high-fire-threat areas.

As described above, a portion of the eastern Planning Area is located in or near an area designated by CAL FIRE as an area of high and very high risk; a portion of that area is also in Tier 2 and Tier 3 areas based on the CPUC's Fire Hazard Severity Zones for utility-associated wildfires. The majority of lands within A VHFHSZ are designated by the General Plan for Open Space Uses, the majority of intensified development would occur in areas of the city that are currently developed with urban uses.

The General Plan includes requirements for adequate water supply and water flow availability, emergency access, fire protection services, fire safe design site standards, and ensuring public awareness regarding fire safety. All future development projects would be required to be consistent with the City's municipal code standards related to development in high fire hazard areas as described previously and would also be subject to CCR and PUC standard outlined above.

As described previously, the Lake Forest General Plan is a long range policy document that does not include site specific designs or proposals, and does not propose or approve any entitlements for development. The majority of all future development would occur within existing developed areas. However, future development may require the limited extension and development of infrastructure such as roads, water and sewer utilities, and fuel breaks into areas designated as VHFHSZ's. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

The potential for future projects to impact environmental resources to meet compliance with fire development standards such (as fuel breaks and clearance requirements) would require site specific environmental require under CEQA to identify any site-specific impacts. As demonstrated throughout this EIR, implementation of the various policies and actions contained in the General Plan would reduce potential impacts associated with the construction and expansion of infrastructure. Implementation of the General Plan policies and actions listed below, combined with local and state requirments, as discussed previously, would ensure that potential wildland fire hazards would not be exacerbated by local infrastructure, and this impact would be reduced to a **less than significant level**.

GENERAL PLAN POLICIES THAT MITIGATE POTENTIAL IMPACTS

PS-2.1: Building Fire Codes. Require that all buildings and facilities within Lake Forest comply with local, state, and federal regulatory standards such as the California Building and Fire Codes as well as other applicable fire safety standards.

PS-2.2: Fire Protection Services. Coordinate with the Orange County Fire Authority and CalFire as it protects the safety and security of the Lake Forest community.

PS-2.3: Fire Hazard Identification. Maintain and regularly update the City's fire hazard overlay map for changes in fire hazard severity districts consistent with changes in hazard designations by CAL FIRE.

PS-2.4: Very High Fire Hazard Zone. Require that all development in Very High Fire Hazard Zones meet Very High Fire Hazard Zone standards as designated by City Ordinance.

PS-2.5: Urban Fire Risks. Work with the City's fire service provider to maintain an ongoing fire inspection program to reduce fire hazards associated with multifamily development, critical facilities, public assembly facilities, industrial buildings, and nonresidential buildings.

PS-2.6: Grant Funding. Seek grant funding, on our own and in collaboration with regional partners, to mitigate potential wildfire threats to the community and to implement special training workshops and projects related to defensible space and fuel reduction practices.

PS-2.7: Regional Coordination. Coordinate with the County of Orange, neighboring cities, and other fire protection agencies to reduce the potential for wildfire hazards in the Saddleback Valley.

PF-8.3: Department Consultation. Promote coordination between the City of Lake Forest and Police and Fire services during the review of new development applications to ensure that adequate attention is being paid to fire and safety concerns during the design and planning of a project.

PF-8.7: Technology. Encourage and support efforts to improve police, fire, and emergency medical services through improved use of modern technology and industry best practices.

Impact 3.16-4: Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. (Less than Significant)

Debris flows and post-fire earthflow hazards include fast-moving, highly destructive debris flows that can occur in the years immediately after wildfires in response to high intensity rainfall events, and flows that are generated over longer time periods that are accompanied by root decay and loss of soil strength. Post-fire debris flows are particularly hazardous because they can occur with little warning, exert great impulsive loads on objects in their paths, strip vegetation, block drainage ways, damage structures, and endanger human life. Debris flows differ from mudflows in that debris flows are composed of larger particles. Fires increase the potential for debris flows in two ways:

1. Fires may bake soil into a hard crust that repels water.
2. Fires destroy vegetation that would slow and absorb rainfall and whose roots would help stabilize soil. (USGS 2018)

Post-fire debris flows are most common in the two years after a fire. It takes much less rainfall to trigger debris flows from burned basins than from unburned areas. In Southern California, as little as 0.3 inch of rainfall in 30 minutes has triggered debris flows, and any storm that has intensities greater than about 0.4 inch per hour can produce debris flows (USGS 2017). The burning of

vegetation and soil on slopes more than doubles the rate that water will run off into watercourses (CGS 2018a).

Expansion of man-made developments into fire-prone wildlands has created situations where fast-moving, highly destructive debris flows triggered by intense rainfall are one of the most dangerous post-fire hazards. Such debris flows are particularly dangerous because they tend to occur with little warning.

After fire events, local creeks, steep slopes and seasonal drainages may become susceptible to increased runoff, landslides and debris flows as a result of cover changes as a result of wildfire. Landslide and slope stability is influenced by physical factors, such as slope, soil, vegetation, and precipitation. Landslides require a slope, and can occur naturally from seismic activity, excessive saturation, and wildfires, or from human-made conditions such as construction disturbance, vegetation removal, wildfires, etc. Figure 3.7-6 (located in Chapter 3.7 Geology and Soils) illustrates the landslide potential (for non-seismically included potential) in the vicinity of the City of Lake Forest. The landslide potential is relatively low in the southwestern portion of the City, where elevation change is relatively low. However, the landslide potential increases in the central and northern portions of the City with the greatest potential in the eastern portions of the city, which contains areas with increased elevation change.

FEMA mapping provides important guidance for the City in planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The FEMA FIRM for the Planning Area is shown on Figure 3.10-3 (located in the Hydrology and Water Quallity Chapter of this DEIR).

As shown on Figure 3.10-3, only a small area within Lake Forest is located within a mapped portion of either the 100-year and 500- year FEMA flood zones and these areas are generally located in the lower and flatter portions of the Planning Area. The areas documented to be subject to 100-year and 500-year flooding within Lake Forest are located along Aliso Creek, Serrano Creek, Borrego Canyon Wash, San Diego Creek, and the lakes. Risk of flooding along these areas is limited, since flooding within this location would be likely to only affect a small area outside of the normal creek bed. The largest area of Lake Forest within the 100-year and 500-year FEMA flood zones is along the Aliso Creek bed and bike trail near Heroes Park along the eastern edge of the City.

The U.S. Geological Survey's Landslide Hazards Program is participating in a multi-agency cooperative effort to investigate debris flows in burned areas of southern California and other parts of the western United States. Participating agencies are the USDA Forest Service, the Natural Resources Conservation Service, and the California, Colorado, and Montana Geological Surveys. The objective of this project is to develop methods needed to estimate the locations, probability of occurrence, and size of potentially destructive debris flows. Public officials can use this information to plan and execute emergency response and post-fire rehabilitation.

Monitoring the movement of surface water is essential in burn areas to provide early warning of flash flooding and debris movement. The USGS maintains extensive groundwater and surface-water monitoring systems, collecting data from more than 500 stream gages throughout the state. In 2014, the Silverado Fire in Orange County (approximately 3 miles northeast of the Lake Forest Planning Area) burned approximately 2.5 square miles in Orange County. After the fire, the USGS predicted debris flows in locally impacted creeks within the burn area and assigned probabilities for debris flow occurrence following rain events.

Estimates by the USGS include the likelihood of debris flow (in %), potential volume of debris flow (in m3), and combined relative debris flow hazard. Predictions are made at the scale of the drainage basin, and at the scale of the individual stream segment. Estimates of probability, volume, and combined hazard are based upon a design storm with a peak 15-minute rainfall intensity of 24 millimeters per hour (mm/h). Probabilities within the Silverado burn area drainages ranged from low to high with some stream segments having as high as an 80% probability of debris flows following a rain event. In response to the Silverado Fire the USGS installed an automated rain-triggered camera to monitor post-wildfire flooding and debris flow at the outlet of a small basin within the burn area to monitor the initial surge and peak flow triggered by an intense rainstorm. The initial surge and peak flow triggered by an intense rainstorm on July 19, 2015 was captured by the USGS and showed that peak flow occurred about 3 minutes after the initial surge/storm event.

No major fires have recently impacted the Planning Area and area fires including the Silverado fire in 2014 do not impact the potential for local debris flows on local waterways within Lake Forest. However, debris flow would be anticipated if burn areas extended into the local watershed and the probabilities of debris flows could be similar to nearby burn areas.

The General Plan would allow development and improvement projects that would involve some land clearing, grading, and other ground-disturbing activities that could temporarily increase soil erosion rates during and shortly after project construction. The majority of intensified development would occur in areas of the city that are currently developed with urban uses and are generally not subject to severe flooding or erosion. As required by the Clean Water Act, each subsequent development project or improvement project will require an approved Storm Water Pollution Prevention Plan (SWPPP) that includes best management practices for grading and preservation of topsoil. SWPPPs are designed to control storm water quality degradation to the extent practicable using best management practices during and after construction.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the CBC, Zoning Ordinance, and other regulations. In addition to compliance with City standards and policies, the Regional Water Quality Control Board will require a project specific Storm Water Pollution Prevention Plan (SWPPP) to be prepared for each project that disturbs an area of one acre or larger. The SWPPPs will include project specific best management measures that are designed to control drainage and erosion. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA.

The General Plan requires the City to review all development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased as a beyond pre-development levels during rain and flood events. Additionally, General Plan Policy PS-3.5 considers the need to expand the capacity of flood control facilities based on changing flood conditions associated with climate change and extreme weather, and Policy PS-3.6 requires that all new developments and redevelopments in areas susceptible to flooding incorporate mitigation measures designed to reduce flood hazards. Policy PS-3.7 ensures the City maintains adequate Infrastructure and regularly assesses the status of local storm drainage infrastructure to ensure that the system can adequately reduce flood hazards. Further, all future development allowed under the General Plan would be subject to all existing building codes and development standards described above to control for runoff, instability, and drainage issues.

In the event that a significant wildfire were to burn in the hillsides east of the City limits, within the watershed area that drains into and through Lake Forest, portions of Lake Forest may be exposed to potential risks associated with landslides and flooding in the weeks, months, and years following the fire as a result in changes to the vegetative cover of the land and the rain absorbtion capacity of the soil. It is important to note that the areas within the City at-risk of exposure to these potential flooding and landslide impacts are largely urbanized, developed, and/or entitled already. Adoption of the proposed General Plan would not increase or exacerbate these risks, however, areas of the City would still remain at risk in the event of a significant wildfire up-slope from the City. This is considered a potentially significant impact, which would be mitigated to a less than significant level through the implementation of the policies and actions listed below.

General Plan Action PS-2a would require the City to coordinate with relevant federal, state, and local agencies, including but not limited to, the USGS, the Orange County Fire Authority, and the Orange County Flood Control District to monitor and predict potential risks associated with flash floods and debris flow following a significant fire event upslope from Lake Forest to the greatest extent feasible, and to implement appropriate response measures in the event that a significant risk from flooding or debris flow is anticipated.

While the City cannot state with certainty that future risks associated with post-fire flooding and debris flow would not occur in Lake Forest, for the reasons explained above, implementation of the General Plan would not exacerbate this risk. Implementation of Action PS-2a would reduce this risk to the greatest extent feasible, resulting in an impact that is **less than significant** as a result of adoption and implementation of the proposed General Plan.

GENERAL PLAN POLICIES AND ACTIONS THAT MITIGATE POTENTIAL IMPACTS

POLICIES

PF-5.1: Maintain Capacity. Encourage the Orange County Flood Control District to maintain sufficient levels of storm drainage service, improve flood control facilities and channel segments, and implement other best practices in order to protect the community from flood hazards.

PF-5.2: Data Collection. Encourage the Orange County Flood Control District to map, track, and analyze data on all current storm drain facilities in order to provide clear and accurate forecasts for future demand.

PF-5.3: Stormwater Runoff. Encourage that stormwater be directed towards permeable surfaces to allow for more percolation of stormwater into the ground.

PF-5.4: Stormwater Capture. Encourage the use of professionally designed stormwater capture methods to aid in the reuse of rain water for non-potable uses in compliance with applicable State regulations.

PF-5.5: Recycled Water. Explore the expansion of infrastructure for recycled stormwater for irrigation and other non-potable uses when safe, financially feasible, and available.

PF-5.6: Stormwater Treatments. Promote Best Management Practices (BMPs) and Low Impact Development measures (LID) to treat stormwater before discharge from the site. The facilities shall be sized to meet regulatory requirements.

PF-5.7: Creeks. Work with the Orange County Flood Control District, and other involved agencies, to implement a solution that balances flood control objectives, retention of natural resources, and provision of recreation opportunities along the community's creeks.

PF-5.8: County Partnerships. Coordinate with the County to ensure that the Orange County Drainage Area Management Plan and the Orange County Stormwater Resource Plan reflect the needs and priorities of Lake Forest.

PF-5.9: National Programs. Cooperate in regional programs to implement the National Pollutant Discharge Elimination System program.

PF-5.10: Materials Discharge. Encourage the Orange County Flood Control District to minimize the discharge of materials into the storm drain system that are toxic or which would obstruct flows.

PS-3.1: Regulatory Compliance. Coordinate with local, state, and federal agencies to ensure that the City's regulations related to flood control are in compliance with federal, State, and local standards.

PS-3.2: FEMA Coordination. Coordinate with the Federal Emergency Management Agency (FEMA) to ensure that Federal Insurance Rate Maps correctly depict flood hazards in the City.

PS-3.3: Municipal Code. Implement the standards and requirements defined in the Municipal Code to reduce flood hazards and address flood-prone areas within Lake Forest.

PS-3.4: Existing Flood Zones. Maintain dialogue with the County of Orange regarding regional flood facilities

PS-3.5: Changing Conditions. Coordinate with the Orange County Flood Control District to consider the need to expand the capacity of flood control facilities based on changing flood conditions associated with climate change and extreme weather.

PS-3.6: Mitigation. Require that all new development and redevelopment in areas susceptible to flooding incorporate mitigation measures designed to reduce flood hazards.

PS-3.7: Adequate Infrastructure. Maintain and regularly assess the status of local storm drainage infrastructure to ensure that the system is functioning property.

PS-3.8: Public Awareness. Promote public education and information dissemination on flooding hazards to help property owners protect their homes and businesses from flood damage.

ACTIONS

PF-5a: Continue to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure that off-site runoff is not increased beyond pre-development levels during rain and flood events.

PS-2a: In the event of a significant wildfire in the upslope areas east of the City, the City shall immediately coordinate with relevant federal, state, and local agencies, including but not limited to the USDA, USFS, CalFire, the Orange County Flood Control District, and the Orange County Fire Authority to establish and implement, as feasible, a flooding and debris flow prediction and monitoring program. The intent of the program shall be to map and assess the likelihood of debris flow (in %), potential volume of debris flow (in m3), and combined relative debris flow hazard. In the event that a flood or debris flow risk is predicted during a subsequent storm event, the City shall implement procedures contained in the Emergency Operations Plan to notify residents and business owners of evacuation orders in affected areas. This action is written and adopted with the understanding that the City of Lake Forest does not possess the resources to implement such a monitoring program independently, and must rely on the expertise and resources of outside agencies.

CEQA requires an EIR to evaluate a project's effects in relationship to broader changes that are occurring or that may foreseeably occur, in the surrounding environment. Accordingly, this chapter presents discussion of CEQA-mandated analysis for cumulative impacts, irreversible impacts, and growth inducement associated with the proposed General Plan.

4.1 CUMULATIVE SETTING AND IMPACT ANALYSIS

INTRODUCTION

CEQA requires that an EIR contain an assessment of the cumulative impacts that could be associated with the General Plan. According to CEQA Guidelines Section 15130(a), "an EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable." "Cumulatively considerable," as defined in section 15065(a)(3), means that "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (as defined by Section 15130). As defined in CEQA Guidelines Section 15355, a cumulative impact consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. A cumulative impact occurs from:

> *…the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.*

In addition, Section 15130(b) identifies that the following three elements are necessary for an adequate cumulative analysis:

1) Either:

> (A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or,
>
> (B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such planning document shall be referenced and made available to the public at a location specified by the lead agency.

2) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and

3) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

CUMULATIVE SETTING

Under CEQA, the discussion of cumulative impacts should focus on the severity of the impacts and the likelihood of their occurrence. The geographic scope for the cumulative analysis covers the entire Lake Forest Planning Area, which includes the City limits and the Sphere of Influence, as shown on Figure 2.0-2 (see Chapter 2.0: Project Description). For Lake Forest, the City limits, SOI, and Planning Area are all contiguous, and therefore represent the same physical boundary. It should be noted that, for some environmental topics, the geographic scope for the cumulative analysis also covers the boundaries of Orange County, the South Coast Air Basin, and/or other jurisdictional boundaries that are relevant to the particular environmental topic.

In most cases in this EIR, the buildout analysis utilizes a 20-year horizon, and 2040 is assumed to be the buildout year of the General Plan. The year 2040 is used as the benchmark year for the cumulative analysis contained in this EIR. This year was chosen based on the fact that the General Plan was developed as a 20-year plan for Lake Forest, and the General Plan is scheduled for adoption in early 2020.

Land Use/Growth Projections

Existing land uses in the Lake Forest Planning Area can be characterized in broad terms of residential, commercial, business park, mixed-use, light industrial, and open space. Table 4.0-1 describes the existing land uses (as of 2018). The predominant land use in the Planning Area is Open Space and Recreation, following by Single Family Residential.

Table 4.0-2 includes a comparison of existing conditions, the current General Plan Land Use Map, and the proposed General Plan Land Use Map in terms of population, housing units, nonresidential development square footage, jobs, and the jobs-to-housing ratio (August 2019), as well as a calculation of annual growth rates of in comparison to the existing conditions (August 2019).

TABLE 4.0-1 EXISTING LAND USES IN THE PLANNING AREA (2018)

CATEGORY	PARCEL COUNT	ACRES	% OF TOTAL ACRES
Open-Space and Recreation	695	3,174	35.0%
Single Family Residential	15,230	2,247	24.5%
Roadways (parcelized and non-parcelized)	130	1,718	16.0%
Vacant1	510	800	8.7%
Multi-Family Residential	644	676	7.4%
Commercial and Services	323	502	5.5%
Industrial	177	435	5.0%
General Office	110	215	2.4%
Mixed Commercial and Industrial	206	191	2.1%
Agriculture	18	192	2.1%
Education	17	156	1.7%
Facilities	33	148	1.6%
Transportation, Communication, and Utilities	39	118	1.3%
Mobile Homes Parks	11	92	1.0%
Water	42	70	0.77%
Mixed Residential	80	7	0.08%
Total	**18,265**	**10,742**	**100%**

NOTE: [1] ACCORDING TO THE ORANGE COUNTY ASSESSOR'S OFFICE, A NUMBER OF CURRENTLY APPROVED AND UNDER DEVELOPMENT PROJECTS ARE IDENTIFIED AS "VACANT". THESE PROJECTS INCLUDE THE NEW CIVIC CENTER AND PORTIONS OF BAKER RANCH AND PORTOLA HILLS. WHEN THESE AREAS ARE EXCLUDED FROM THE QUALIFICATION OF VACANT LAND, IT BECOMES CLEAR THAT THERE IS VERY LITTLE VACANT UNENTITLED/UNPLANNED LAND LEFT IN THE CITY OF LAKE FOREST.
SOURCE: ORANGE COUNTY ASSESSOR'S OFFICE, 2018; DE NOVO PLANNING GROUP, 2018.

TABLE 4.0-2: COMPARATIVE GROWTH PROJECTIONS, CURRENT GENERAL PLAN LAND USE MAP AND DRAFT LAND USE MAP

	HOUSING UNITS	POPULATION	NONRESIDENTIAL SQUARE FOOTAGE	JOBS	JOBS PER HOUSING UNIT
EXISTING CONDITIONS (8/1/19)					
Planning Area	28,928	81,888	15,315,700	38,039	1.31
BUILDOUT CONDITIONS: PLANNING AREA					
Current General Plan	36,700	108,998	26,077,229	48,209	1.31
Draft Land Use Map	51,334	152,462	27,726,585	52,241	1.02
NEW GROWTH: PLANNING AREA					
Over Existing Conditions	22,406	70,574	12,410,885	14,202	-
Annual Growth Rate Over Existing Conditions	*2.769%*	*3.004%*	*2.867%*	*1.522%*	-
Over Current General Plan	14,634	43,464	1,649,356	4,032	-

SOURCE: DE NOVO PLANNING GROUP, 2019

Proposed land uses in the Lake Forest Planning Area are shown in Table 4.0-3. Table 4.0-3 breaks down the Planning Area Buildout Potential by General Plan Land Use Designation, including acres assigned to each land use and associated housing units, population growth, non-residential building square footage, and jobs at buildout. Table 4.0-4 quantifies how the Planning Area

Buildout Potential for the General Plan Update compares to the Planning Area Buildout Potential under the City's Current General Plan.

TABLE 4.0-3: PLANNING AREA BUILDOUT POTENTIAL

LAND USE DESIGNATION	*TOTAL ACRES*	*HOUSING UNITS AT BUILDOUT*	*POPULATION GROWTH AT BUILDOUT*	*NON-RESIDENTIAL BUILDING SQUARE FOOTAGE AT BUILDOUT*	*JOBS AT BUILDOUT*
RESIDENTIAL LAND USES					
Very Low Density Residential	-	-	-	-	-
Low Density Residential	2,499	17,023	50,559	-	-
Low-Medium Density Residential	880	9,589	28,481	-	-
Medium Density Residential	361	7,931	23,555	-	-
High Density Residential	16	620	1,840	-	-
Residential Subtotal	*3,756*	*35,163*	*104,435*	-	-
NON-RESIDENTIAL LAND USES					
Commercial	280	-	-	3,054,326	6,787
Professional Office	8	-	-	110,398	368
Business Park	298	-	-	4,545,819	7,576
Light Industrial	627	-	-	9,565,602	15,943
Public Facility	373	-	-	811,508	812
Non-Residential Subtotal	*1,586*	-	-	*18,087,653*	*31,486*
MIXED-USE LAND USES					
Mixed-Use 32	101	3,234	9,605	1,100,607	2,446
Mixed-Use 43	295	7,567	22,473	5,133,082	11,407
Mixed-Use 60	68	3,265	9,696	1,481,288	3,292
Mixed-Use Office	24	-	-	513,715	1,284
Urban Industrial 25	52	1,155	3,430	914,637	1,524
Urban Industrial 43	26	950	2,823	460,007	767
Mixed-Use Subtotal	*566*	*16,171*	*48,027*	*9,603,336*	*20,720*
LIMITED DEVELOPMENT LAND USES					
Community Park/Open Space	249	-	-	27,148	27
Regional Park/Open Space	1,939	-	-	8,448	8
Open Space	877	-	-	-	-
Lake	58	-	-	-	-
Transportation Corridor	30	-	-	-	-
Right-of-Way	1,681	-	-		
Limited Development Subtotal	*4,834*	-	-	*35,596*	*36*
Totals	**10,742**	**51,334**	**152,462**	**27,726,585**	**52,242**

SOURCE: DE NOVO PLANNING GROUP, 2019

TABLE 4.0-4: POTENTIAL NEW GROWTH IN PLANNING AREA OVER CURRENT GENERAL PLAN

LAND USE DESIGNATION	*TOTAL ACRES*	*NEW HOUSING UNITS AT BUILDOUT*	*NEW POPULATION GROWTH AT BUILDOUT*	*NEW NON-RESIDENTIAL BUILDING SQUARE FOOTAGE AT BUILDOUT*	*NEW JOBS AT BUILDOUT*
RESIDENTIAL LAND USES					
Very Low Density Residential	-	-	-	-	-
Low Density Residential	2,499	795	2,361	-	-
Low-Medium Density Residential	880	(594)	(1,763)	-	-
Medium Density Residential	361	(642)	(1,907)	-	-
High Density Residential	16	-	-	-	-
Residential Subtotal	*3,756*	*(441)*	*(1,309)*	-	-
NON-RESIDENTIAL LAND USES					
Commercial	280	-	-	(3,066,453)	(6,814)
Professional Office	8	-	-	(278,837)	(929)
Business Park	298	-	-	753,004	1,255
Light Industrial	627	-	-	(1,581,695)	(2,636)
Public Facility	373	-	-	0	0
Non-Residential Subtotal	*1,586*	-	-	*(4,173,981)*	*(9,124)*
MIXED-USE LAND USES					
Mixed-Use 32	101	3,234	9,605	1,100,607	2,446
Mixed-Use 43	295	6,471	19,219	2,859,973	6,355
Mixed-Use 60	68	3,265	9,696	1,481,288	3,292
Mixed-Use Office	24	-	-	513,715	1,284
Urban Industrial 25	52	1,155	3,430	914,637	1,524
Urban Industrial 43	26	950	2,823	460,007	767
Mixed-Use Subtotal	*566*	*15,075*	*44,773*	*7,330,227*	*15,668*
LIMITED DEVELOPMENT LAND USES					
Community Park/Open Space	249	-	-	(882)	(1)
Regional Park/Open Space	1,939	-	-		
Open Space	877	-	-	-	-
Lake	58	-	-	-	-
Transportation Corridor	30	-	-	-	-
Right-of-Way	1,681				
Limited Development Subtotal	*4,834*			*(882)*	*(1)*
Totals	**10,742**	**14,634**	**43,464**	**3,155,364**	**6,543**

SOURCE: DE NOVO PLANNING GROUP, 2019

Much like the existing General Plan Land Use Map, under the proposed Land Use Map, predominant land uses within the City limits remain open space and residential, ranging from the very low to high density ranges.

CUMULATIVE EFFECTS OF THE PROJECT

Method of Analysis

Although the environmental effects of an individual project may not be significant when that project is considered separately, the combined effects of several projects may be significant when considered collectively. Section 15130 of the CEQA Guidelines requires a reasonable analysis of a project's cumulative impacts, which are defined as "two or more individual effects which, when considered together are considerable or which compound or increase other environmental impacts." The cumulative impact that results from several closely related projects is: the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (State CEQA Guidelines 15355[b]). Cumulative impact analysis may be less detailed than the analysis of the project's individual effects (State CEQA Guidelines 15130[b]).

In order to assess cumulative impacts, an EIR must analyze either a list of past, present, and probable future projects (referred to as the “list approach”) or a summary of projections contained in an adopted general plan or related planning document (referred to as the “projection method”). Because of the programmatic nature of the Lake Forest General Plan, this Draft EIR uses the **projection method** for the cumulative analysis and considers buildout of the proposed General Plan in addition to buildout of the other General Plans within Orange County. Any such planning document shall be referenced and made available to the public at a location specified by the Lead Agency for that specific project. The General Plans considered as part of this cumulative analysis include those for all jurisdictions in the County of Orange, including:

- County of Orange
- City of Aliso Viejo
- City of Anaheim
- City of Brea
- City of Buena Park
- City of Costa Mesa
- City of Cypress
- City of Dana Point
- City of Fountain Valley
- City of Fullerton
- City of Garden Grove
- City of Huntington Beach
- City of Irvine
- City of La Habra
- City of La Palma
- City of Laguna Beach
- City of Laguna Hills
- City of Laguna Niguel
- City of Laguna Woods
- City of Lake Forest
- City of Los Alamitos
- City of Mission Viejo
- City of Newport Beach
- City of Orange
- City of Placentia
- City of Rancho Santa Margarita
- City of San Clemente
- City of San Juan Capistrano
- City of Santa Ana
- City of Seal Beach
- City of Stanton
- City of Tustin
- City of Villa Park
- City of Westminster
- City of Yorba Linda

The Projection Method serves as a guide to determine if the General Plan Update is consistent with the long-term population, employment, and household projections of the region. If the proposed General Plan Update is generally consistent with regional projections, then it would also generally be consistent with regional efforts to address environment problems such as air quality and traffic.

Cumulative Impacts

Cumulative impacts for most issue areas are not quantifiable and are therefore discussed in general qualitative terms as they pertain to development patterns in the surrounding region. An exception to this is a topic like traffic, which may be quantified by estimating future traffic patterns, pollutant emitters, etc. and determining the combined effects that may result. In consideration of the cumulative scenario described above, the proposed project may result in the following cumulative impacts.

AESTHETICS AND VISUAL RESOURCES

Impact 4.1: Cumulative degradation of the existing visual character of the region (Less than Cumulatively Considerable)

While the Lake Forest Planning Area contains numerous areas and viewsheds with relatively high scenic value, there are no officially designated scenic vista points in the Planning Area. Additionally, there are no officially designated scenic highways located in the vicinity of Lake Forest. Significant visual resources in the Planning Area include several prominent creeks, including Aliso Creek, Serrano Creek, San Diego Creek, and the Borrego Canyon Wash, and the Eucalyptus groves that surround portions of the these lakes. Other prominent visual features throughout the Planning Area include views of ridgelines, hillsides, and canyons.

The most significant visual features outside the Lake Forest Planning Area are the Saddleback mountains just to the northeast, the most prominent landmark being Santiago Peak at 5,687 feet above mean sea level. Views of the mountains are available from most parts of Lake Forest and are one its most notable visual assets.

However, as noted in greater detail in the Project Description chapter (chapter 2.0), implementation of the proposed General Plan could lead to new and expanded urban and suburban development throughout the city. This new development may result in changes to the skyline throughout the Planning Area, which may obstruct or interfere with views of visual features surrounding the Planning Area, including views of Santiago Peak.

Furthermore, buildout under the proposed General Plan and implementation of the General Plan Land Use Map has the potential to result in new and expanded development along highway corridors with high scenic values, even though these corridors are not officially designated as State Scenic Highways. Additionally, expanded development could occur alongside roadways within the City of Lake Forest considered landscape corridors by the Orange County General Plan, which include El Toro Road and a portion of Santa Margarita Parkway.

While growth is anticipated to occur in the Lake Forest Planning Area and within the other cities within Orange County, the majority of growth is anticipated to occur in and around existing urban development. Development of land uses and associated infrastructure is planned to occur in the future to accommodate growth envisioned in the general plans that are effective within the cumulative analysis area, including Orange County and the cities of Irvine, Laguna Beach and Anaheim.

Regional growth has and will continue to result in a cumulative aesthetic effect by converting undeveloped land into developed and occupied areas and increasing overall levels of nighttime lighting. Cumulative development entails grading/landform alteration, the development of structures, and the installation of roadways and other infrastructure that has altered and will continue to permanently alter the region's existing visual character. This is considered a potentially significant cumulative impact. Subsequent projects implemented under the proposed General Plan would be required to be consistent with the policies and actions of the proposed General Plan and adopted regulations pertaining to aesthetics and lighting in Lake Forest. With implementation of adopted policies and regulations provided in Section 3.1 (Aesthetics and Visual Resources), the proposed General Plan would not considerably contribute to permanent changes in visual character, such as obstruction of scenic views, conversion of existing visual character, and increased lighting. The polices and actions included within the General Plan would fully reduce the cumulative effect of the General Plan on visual character, to mitigate the proposed project's contribution to a less-than-significant level. Therefore, the proposed General Plan's incremental contribution to this cumulative impact would be **less than cumulatively considerable**.

AGRICULTURAL AND FOREST RESOURCES

Impact 4.2: Cumulative impact to agricultural lands and resources (Considerable Contribution and Significant and Unavoidable)

As shown in Table 3.2-1, there are approximately 140.3 acres of Important Farmlands located within the City, including 0.2 acres of Prime Farmland and 140.1 acres of Unique Farmland. The Prime Farmland is located west of Alton Parkway and south of State Route 241, adjacent to an area containing Unique Farmland. The Prime Farmland area is currently developed with residential uses (Shea/Baker Ranch Project). The Unique Farmland is located in two nearby areas in the center of the City: one area west of Alton Parkway and south of State Route 241 (adjacent to the 0.2 acres of Prime Farmland), and one area east of Bake Parkway and south of Rancho Parkway. The Unique Farmland area west of Alton Parkway and south of State Route 241 is currently developed with residential uses (Shea/Baker Ranch Project). The Unique Farmland area east of Bake Parkway and south of Rancho Parkway is known as the Nakase site. The Nakase site contains the Nakase Brothers Wholesale Nursery.

As shown on the General Plan Land Use Map (Figure 2.0-3), all of the land within the Planning Area is planned for urban development in one form or another, with the exception of areas designated for Open Space or Regional Park/Open Space uses. Therefore, it is assumed that the agricultural viability of all of the Important Farmlands within the City will eventually be lost upon full buildout of the Lake Forest General Plan. Future development of the Nakase site consistent with the

General Plan Land Use Map would result in conversion of the Unique Farmland. The Nakase site is located in an area surrounded by urban development on all sides, and is not located in an area that is conducive to active agricultural operations.

In summary, the Draft EIR for the Nakase Nursery/Toll Brothers Project has not been certified, and the Findings of Fact and Statement of Overriding Considerations have not been adopted. Should the Nakase Nursery/Toll Brothers Project not be approved, the site would remain in the current condition in the short term, but would be expected to eventually convert to urban uses sometime in the future. Implementation of the proposed General Plan may lead to the urbanization of this portion of Unique Farmland in the long-term, should the Nakase Nursery/Toll Brothers Project not be approved.

The General Plan has taken a proactive approach towards focusing new growth and development towards infill locations, and protecting open space areas and agricultural lands throughout the Planning Area to the greatest extent feasible. The applicable policies and actions that provide protection and preservation of agricultural lands are identified under Impact 3.2-2.

However, as described in greater detail under Impact 3.2-1, there is no feasible mitigation available to reduce this impact to a less than significant level. The Nakase site has been designated for urban uses since the City adopted the 1994 General Plan. The site is completely surrounded by urban uses, and is located within the geographic center of Lake Forest. As such, there is no long-term agricultural viability of the site. Other conversions of farmland within Orange County over the buildout period is also likely to occur. The policies and actions identified under Impact 3.2-2 would mitigate this impact to the greatest extent feasible, and other General Plans in Orange County have also mitigated potential impacts to agricultural resources. Nevertheless, this is considered a cumulatively considerable and **significant and unavoidable** impact.

AIR QUALITY

Impact 4.3: Cumulative impact on the region's air quality (Considerable Contribution and Significant and Unavoidable)

Construction of the growth anticipated by the proposed General Plan has the potential to temporarily emit criteria air pollutant emissions through the use of heavy-duty construction equipment, and through vehicle trips generated by workers and haul trucks. In addition, fugitive dust emissions would result from demolition and various soil-handling activities. Mobile source emissions, primarily NOx and PM emissions (i.e., PM_{10} and $PM_{2.5}$), would result from the use of diesel-powered on- and off-road vehicles and equipment. Construction emissions can vary substantially from day-to-day, depending on the level of activity and the specific type of construction activity. As shown in Table 3.3-5 in Section 3.3 (Air Quality), construction-related daily emissions would exceed the SCAQMD significance thresholds for VOCs.

Operation of the proposed project would generate criteria air pollutant emissions from project-generated vehicle trips traveling within the City, energy sources such as natural gas combustion, and area sources such as landscaping equipment and consumer products usage. As identified in

Table 3.3-6 in Section 3.3 (Air Quality), operational emissions for the proposed project would also exceed regulatory thresholds (for VOC, NOx, CO, PM_{10}, and $PM_{2.5}$). Feasible mitigation measures are incorporated into the policies and actions included within the General Plan. However, there are no feasible criteria air pollutant reduction measures beyond those identified within the policies and actions listed under Impact 3.3-1 and throughout Section 3.3, that would reduce impacts. While implementation of these policies and actions would reduce criteria pollutant emissions, the extent to which the impacts would be generated by future development and infrastructure projects have to be determined on a project-by-project basis, as necessary.

Moreover, with respect to local air quality emissions, toxic air contaminant emissions, and health impacts, future development under the General Plan would be required to comply with AQMP, SIP, CARB, SCAQMD regulations, Title 24 energy efficiency standards, and the proposed General Plan policies and actions. Implementation of the policies and actions listed in Section 3.3 would mitigate and reduce such emissions. However, as there is no way to determine the extent to which these regulations will be, or need to be, implemented, it is impossible to determine if potential impacts would be reduced to below regulatory thresholds because the details and potential emissions levels of future development projects is not known at this time, as there are no specific development projects proposed as part of the General Plan Update. Additionally, there are no feasible mitigation measures beyond the policies and actions listed in Section 3.3 (Air Quality). Therefore, localized operational impacts, construction and operational health and toxic air impacts would remain significant and unavoidable.

Lastly, with respect to other emissions, future development under the proposed General Plan would be required to comply with AQMP, SIP, CARB, SCAQMD regulations, Title 24 energy efficiency standards, and the proposed General Plan policies and actions. However, as there is no way to determine the extent to which these regulations will be, or need to be, implemented, it is impossible to determine if potential impacts would be reduced to below regulatory thresholds. There are no feasible mitigation measures except for those listed in Section 3.3 (Air Quality). Based on these impacts, the General Plan would contribute to a cumulative impact with regard to air quality in the region and within the air basin (i.e. the South Coast Air Basin) as a whole. Therefore, this impact is considered a cumulatively considerable and **significant and unavoidable** impact.

BIOLOGICAL RESOURCES

Impact 4.4: Cumulative loss of biological resources, including habitats and special status species (Less than Cumulatively Considerable)

Cumulative development anticipated throughout the greater Orange County region will result in impacts to biological resources, including the permanent loss of habitat for special status species, corridor fragmentation, direct and indirect impacts to special status species, and reduction and degradation of sensitive habitat. Biological resources are a limited resource and the cumulative loss is considered significant.

Subsequent projects implemented under the proposed General Plan would be required to be consistent with the policies and actions of the proposed General Plan. The implementation of an

individual project would require a detailed and site-specific review of the site to determine the presence or absence of movement corridors, special-status species, and sensitive habitat on a given project site. If movement corridors, special-status species, or sensitive habitat are present and disturbance is required, Federal and State laws require measures to reduce, avoid, or compensate for impacts to these resources. The requirements of these Federal and State laws are implemented through the permit process. However, as provided under Section 3.4 (Biological Resources), with implementation of the policies and actions included within the General Plan, implementation of the General Plan would not generate a significant impact on biological resources. Therefore, the proposed General Plan's incremental contribution to this cumulative impact would be **less than cumulatively considerable**.

CULTURAL AND TRIBAL RESOURCES

Impact 4.5: Cumulative impacts on known and undiscovered cultural resources (Less than Cumulatively Considerable)

Construction of the individual development projects allowed under the land use designations of the proposed General Plan may result in the discovery and removal of cultural resources, including archaeological, paleontological, historical, and Native American resources and human remains. The proposed General Plan policies and actions, as well as State and Federal regulations, will reduce the risk to resources in the region. As discussed in Section 3.5 (Cultural and Tribal Cultural Resources), each project would require specific surveys for potential resources and the evaluation of any resources discovered during construction activities. Other policies and actions designed to reduce impacts to cultural and tribal cultural resources within the Planning Area and the the region as a whole are also provided in Section 3.5 (Cultural and Tribal Cultural Resources). Adherence to these policies, actions, and regulations will avoid and/or minimize a cumulative loss of these important resources if they are found during project-specific surveys or construction. Therefore, the proposed General Plan's incremental contribution to cumulative cultural resource impacts would be **less than cumulatively considerable**.

GEOLOGY AND SOILS

Impact 4.6: Cumulative impacts related to geology and soils (Less than Cumulatively Considerable)

Construction of the individual development projects allowed under the land use designations of the proposed General Plan will result in risks associated with geology and soils. For example, there is an ongoing possibility that a fault located anywhere in the state (or region) could rupture and cause seismic ground shaking. Additionally, grading, excavation, removal of vegetation cover, and loading activities associated with construction activities could temporarily increase runoff, erosion, and sedimentation. Other geologic risks such as liquefaction, landsliding, lateral spreading, and soil expansion are also geologic risks that are present.

While some cumulative impacts will occur in the region as individual projects are constructed, the proposed General Plan policies and actions, as well as State and Federal regulations, will reduce the risk to people in the region. Considering the protection granted by local, State, and Federal

agencies and their requirements for seismic design, as discussed in Section 3.6 (Geology and Soils), the overall cumulative impact would not be significant. As a result, the proposed General Plan's incremental contribution to cumulative geologic and soil impacts would be **less than cumulatively considerable**.

GREENHOUSE GASES, CLIMATE CHANGE, AND ENERGY

Impact 4.7: Cumulative impacts related to greenhouse gases, climate change, and energy (Less than Cumulatively Considerable)

Implementation of the Lake Forest General Plan would not directly result in the creation of GHG emissions. However, subsequent development allowed under the General Plan would result in new projects that would increase GHG emissions in the Lake Forest Planning Area.

There are a variety of ways in which a general plan could contribute to climate change and result in the generation of GHGs. Sprawling land use patterns that place residences far from employment and retail centers can result in increased vehicle miles traveled (VMT), which increase GHG generation. The conversion of forest lands and open space areas into urbanized uses removes vegetation and trees that have positive carbon sequestration value. Imbalances between local jobs and housing can result in increased commute times and increased VMT associated with longer travel distances between home and work.

Cumulative impacts are the collective impacts of one or more past, present, and future projects that, when combined, result in adverse changes to the environment. GHG emissions are cumulative by nature, given that they spread throughout the atmosphere on a global scale. In determining the significance of a project's contribution to anticipated adverse future conditions, a lead agency should generally undertake a two-step analysis. The first question is whether the *combined* effects from *both* the proposed project *and* other projects would be cumulatively significant. If the agency answers this inquiry in the affirmative, the second question is whether "the project's *incremental* effects are cumulatively considerable" and thus significant in and of themselves. The cumulative project list for this issue (climate change) comprises anthropogenic (i.e., human-made) GHG emissions sources across the globe and no project alone would reasonably be expected to contribute to a noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context and process for developing an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and, therefore, significant.

The CEQA Guidelines set forth a basic framework for developing a plan to reduce GHG emissions and acknowledges the role CEQA plays in ensuring the impacts of climate change are addressed. CEQA Guidelines Section 15183.5 provide a framework for the development of "Plans for the Reduction of Greenhouse Gas Emissions" for use in programmatic environmental review. Compliance with CEQA Guidelines section 15183.5 allows later project-specific environmental

documents to tier from and/or incorporate by reference such existing programmatic review. CEQA Guidelines section 15183.5 (a) states that: "Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions." In this regard, a Plan for Reducing GHG Emissions has been developed for the City of Lake Forest, and is provided in Section 3.7 (Greenhouse Gases, Climate Change, and Energy).

Table 3.7-2 of Section 3.7 (Greenhouse Gases, Climate Change, and Energy) provides the 2015 baseline year community GHG emissions inventory, as well as an estimate of each inventory sector's per capita contribution to the City's total per capita GHG emissions for year 2015. Based on existing population levels for baseline year 2015 and forecasted population as provided in Table 2.0-3 of the Project Description (See *Chapter 2.0: Project Description* of this DEIR), per capita emissions in baseline year 2015 are estimated at 5.18 MT CO_2e per capita (derived by dividing 414,479 MT CO_2e by a 2015 year population of 80,070).

Tables 3.7-3 through 3.7-5 provide proposed project forecasts for future year community GHG emissions by sector, for years 2030, 2040, and 2050, respectively. Two separate forecast scenarios are provided for each forecast year. The first forecast scenario, the "BAU Plus Proposed Project" scenario, reflects the BAU scenario after proposed project (General Plan) land use assumptions are incorporated (to reflect the land use scenario provided into the General Plan). This forecast reflects the long-term forecast for the General Plan and includes trends reflecting existing and planned local programs and policies, including those identified in the General Plan. The "Legislative-adjusted BAU Plus Proposed Project" scenario builds on the "BAU Plus Proposed Project" scenario by further incorporating the GHG reduction benefits of these Federal and State actions that are designed to reduce GHG emissions, such as the Pavley Clean Car Standards (AB 1493) and the Renewable Portfolio Standard (established under SB 1078).[1]

As shown in Tables 3.7-3 through 3.7-5, GHG emissions in Lake Forest are estimated to increase over time under the BAU Plus Proposed Project scenario. However, under the Legislative-adjusted BAU Plus Proposed Project scenario, GHG emissions in Lake Forest are forecasted to decline from the 2015 baseline through around 2030, then peak around the 2040 buildout year, before declining through to 2050. The reductions in GHG emissions around 2030 and again around 2050 are primarily due to aggressive actions by the State to increase energy efficiency both at the building and utility levels (e.g. via increasing Title 24 building energy efficiency standards and the Renewable Portfolio Standard) during these timeframes. Efforts to reduce on-road transportation GHG emissions (such as by the Pavley Clean Car Standards), also play a major role in reducing GHG emissions through the forecast years. Overall, Federal and State actions reduce overall BAU Plus Proposed Project GHG emissions by approximately 39% in year 2030, 43% in year 2040, and 57% in year 2050.

[1] See the discussion under Methodology for a full list of federals/state actions that are incorporated into the legislative-adjusted BAU scenario.

Based on forecasted population levels for each forecast year and the results provided in the referenced tables, after taking into account federal and state actions (i.e. as provided under the Legislative-adjusted BAU Plus Proposed Project scenarios), per capita emissions are estimated to decline from 5.18 MT CO_2e to 2.83 MT CO_2e in year 2030 (derived by dividing 320,954 MT CO_2e by a projected 2030 year population of 113,401), 2.43 MT CO_2e in year 2040 (derived by dividing 650,834 MT CO_2e by a projected 2040 year population of 152,462), and 1.69 MT CO_2e in year 2050 (derived by dividing 346,395 MT CO_2e by a projected 2050 year population of 204,977). Table 3.7-6 provides a summary of these per capita results.

As shown in Table 3.7-6, the proposed project would achieve the per capita GHG targets for years 2030 and 2040 (buildout year). Although Table 3.7-6 identifies that the proposed project would not meet the per capita GHG target for year 2050, year 2050 is outside of the scope of the proposed project, since the proposed project buildout year would occur by 2040. Therefore, year 2050 information is provided herein for informational purposes only.

Therefore, as demonstrated in the analysis provided above, the proposed project is consistent with the CEQA Guidelines Section 15183.5 framework for developing a plan to reduce GHG emissions. The proposed project is consistent with the six "Plan Elements" that should be included in a plan to reduce GHG emissions. The City of Lake Forest would not exceed the per capita GHG emission targets established to ensure compliance with SB 32 and other California legislation for future year 2030 and General Plan buildout year 2040. Moreover, the proposed project includes a range of goals and policies that would reduce GHG emissions, as provided below. Therefore, the proposed project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

As future development projects are received and reviewed by the City in subsequent years, those projects will be reviewed for consistency with the General Plan and all relevant State-level programs and requirements. All future projects must implement the most current version of the Title 24 energy efficiency requirements, as required by State law. Consistency with the General Plan and other mandatory State-level programs would ensure that future project-level contributions to global climate change would be less than significant. Moreover, as identified in Section 3.7 (Greenhouse Gases, Climate Change, and Energy), buildout of the General Plan would not be expected cause an inefficient, wasteful, or unnecessary use of energy resources nor conflict with or obstruct a state or local plan for renewable energy or energy efficiency. As a result, the proposed General Plan's incremental contribution to cumulative greenhouse gas, climate change, and energy impacts would be **less than cumulatively considerable**.

HAZARDS AND HAZARDOUS MATERIALS

Impact 4.8: Cumulative impacts related to hazardous materials and human health risks. (Considerable Contribution and Significant and Unavoidable)

Construction of the individual development projects allowed under the land use designations of the proposed General Plan may involve the transportation, use, and/or disposal of hazardous materials, which may involve the use of equipment that contains hazardous materials (e.g.,

solvents and fuels or diesel-fueled equipment), or the transportation of excavated soil and/or groundwater containing contaminants from areas that are identified as being contaminated. Furthermore, because of the regional nature of the General Plan, some future land uses will inevitably transport or use hazardous materials within ¼ mile of a school, or other sensitive receptors such as hospitals and residences.

While some cumulative impacts will occur in the region as individual projects are constructed, the proposed General Plan policies and actions, as well as State and Federal regulations, will reduce the risk to people in the region. Considering the protection granted by local, State, and Federal agencies and their requirements for the use of hazardous materials in the region, as discussed in Section 3.8 (Hazards and Hazardous Materials), the overall cumulative impact for most hazards impacts would not be significant. However, the overall cumulative impact for wildfire is considered significant and unavoidable, given that existing and limited future development in Lake Forest would be allowed in areas identified as having a very high risk of wildfire. Therefore, there will always be a risk of loss of life and property as a result of wildland fires within populated areas of the City of Lake Forest. It is possible that development in areas identified as having a very high risk of wildfire would exacerbate the potential for wildfires that travel through Lake Forest to increase in strength, thereby potentially increasing the potential impact of wildfires on neighboring cities in Orange County and potentially beyond. Therefore, this impact is considered a cumulatively considerable and **significant and unavoidable** impact.

HYDROLOGY AND WATER QUALITY

Impact 4.9: Cumulative impacts related to hydrology and water quality. (Less than Cumulatively Considerable)

Construction of the individual development projects allowed under the land use designations of the proposed General Plan has the potential to result in construction-related water quality impacts, impacts to groundwater recharge, and cause flooding, erosion, or siltation from the alteration of drainage patterns.

While some cumulative impacts will occur in the region as individual projects are constructed, the proposed General Plan policies and actions, as well as State and Federal regulations, will substantially reduce the impacts. Considering the protection granted by local, State, and Federal agencies and their permit and monitoring requirements, as discussed in Section 3.9 (Hydrology and Water Quality), and with implementation of the policies and actions included within the General Plan, the overall cumulative impact would not be significant. As a result, the General Plan's incremental contribution to cumulative hydrology impacts would be **less than cumulatively considerable**.

LAND USE, POPULATION, AND HOUSING

Impact 4.10: Cumulative impacts related to local land use, population, and housing (Less than Cumulatively Considerable)

Cumulative land use and planning impacts, such as the potential for conflicts with adjacent land uses and consistency with adopted plans and regulations, are typically site and project-specific. It

may be determined in the project-specific design phase of a development project that an individual project may require removal of homes and result in the displacement of people and housing; however, these effects are not cumulatively considerable because there is adequate replacement housing available under the proposed General Plan. Additionally, any removal of homes would require adequate compensation to the homeowner in accordance with Federal and State laws.

The land uses allowed under the proposed General Plan provide opportunities for cohesive new growth at in-fill locations within existing urbanized areas, as well as limited new growth within the Planning Area, but would not create physical division within existing communities. New development and redevelopment projects would be designed to complement the character of existing neighborhoods and provide connectivity between existing development and new development within the cumulative analysis area. The proposed General Plan does not include any new roadways, infrastructure, or other features that would divide existing communities. Moreover, with implementation of General Plan policies and actions intended to guide growth to appropriate areas and provide services necessary to accommodate growth, the land uses allowed under the proposed General Plan, the infrastructure anticipated to accommodate proposed land uses, and the goal and policy framework would not induce growth that would exceed adopted thresholds. Lastly, General Plan implementation would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere Therefore, the proposed General Plan's incremental contribution to cumulative land use and population impacts would be **less than cumulatively considerable**.

MINERAL RESOURCES

Impact 4.11: Cumulative impacts related to mineral resources (Less than Cumulatively Considerable)

Within the Planning Area, mineral resources include sand and gravel. Approximately 62 acres of land in the eastern portion of the City is designated as MRZ-2. The MRZ-2 resource area, previously known as the El Toro Materials Sand and Gravel Operation, in the eastern portion of the City was previously excavated for sand and gravel materials. The area is classified as an important MRZ for PCC grade aggregate by the DOC. PCC-grade aggregate is valuable in Southern California where it used for a variety of construction purposes. However, the El Toro Materials Sand and Gravel Operation is no longer operational. The 62-acre area designated as MRZ-2 is currently developed with residential uses, a baseball field, and a storm drain basin. As such, the 62-acre area is no longer available for mining.

Given that the only known MRZ in Lake Forest has already been mined and then subsequently developed, there is no additional potential for resource extraction from this MRZ. There are no other known mineral deposits or resources within Lake Forest that are of significant value to the region or the state.

Separately, the Planning Area does not contain a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. As noted above, the El Toro

Materials Sand and Gravel Operation is no longer operational. The 62-acre area designated as MRZ-2 is currently developed and is no longer available for mining. The proposed project would not result in loss of a mineral resource. As a result, the General Plan's incremental contribution to cumulative mineral resource impacts would be **less than cumulatively considerable**.

NOISE

Impact 4.12: Cumulative impacts related to noise (Considerable Contribution and Significant and Unavoidable)

Tables 3.12-15 and 3.12-16 show the existing and cumulative noise levels associated with traffic on the local roadway network, including projects within the Planning Area. Cumulative conditions include traffic due to buildout of the General Plan in addition to pass-through traffic from other jurisdictions. The tables also show the estimated noise level increases which may occur under cumulative conditions.

As shown in the above-referenced tables, cumulative conditions would not contribute to an exceedance of the City's transportation noise standards and would not result in significant increases in traffic noise levels at existing sensitive receptors.

General Plan Policies PS-6.1 through PS-6.10, and Actions PS-6a through PS-6d, are intended to minimize exposure to excessive noise, including noise associated with traffic. Specifically, Policies PS-6.1 and PS-6b support noise-compatible land uses in the vicinity of traffic noise sources and require that new development and infrastructure projects be reviewed for consistency with the noise standards established in Tables PS-1 and PS-2. The proposed General Plan standards required under Policy PS-6.1 and PS-6b, for exposure to traffic noise shown in Table 3.12-15 and Table 3.12-16, do not exceed the noise level standards of the adopted General Plan shown in Table 3.12-10. Policy PS-6.4 and Actions PS-6b and PS-6c would ensure that new development mitigates potential noise impacts through incorporating the noise control treatments necessary to achieve acceptable noise levels. Action PS-6d sets criteria for evaluating future increases in traffic noise levels. Action PS-6a would ensure that the Municipal Code, including the updated noise ordinance, is consistent with the noise standards established in the General Plan. Policy PS-6.6 would encourage working with Caltrans to ensure that adequate noise studies are prepared and that noise mitigation measures are considered in State transportation projects. As described in Impact 3.12-1, implementation of the proposed policies and actions of the General Plan will reduce noise and land use compatibility impacts from vehicular traffic noise sources and would ensure that new development is designed to include noise-attenuating features. As shown in Table 3.13-15 and Table 3.13-16, the traffic noise increases associated with the proposed General Plan do not exceed the applicable noise exposure criteria. Therefore, the proposed General Plan would have a **less than cumulatively considerable** impact relative to traffic noise.

PUBLIC SERVICES AND RECREATION

Impact 4.13: Cumulative impacts to public services and recreation (Less than Cumulatively Considerable)

Development accommodated under the General Plan would result in additional residents and businesses in the City, including new residential, industrial, office, and commercial uses. As described in Chapter 2.0, the General Plan is expected to accommodate up to 22,406 new residential dwelling units and up to 12,410,885 square feet of non-residential building space within the city limits at full buildout.

This new growth within the City limits would increase the City's population by up to 70,574 residents and would include approximately 14,202 new jobs. The full development of the new non-residential uses shown in Chapter 2.0 (Project Description) Table 2.0-2.

Development and growth facilitated by the General Plan would result in increased demand for public services, including fire protection, law enforcement, schools, parks, libraries, and other public and governmental services. The General Plan includes policies and actions to ensure that public services are provided at acceptable levels and to ensure that development and growth does not outpace the provision of public services.

Cumulative growth that would occur within Orange County and other cities within Orange County over the life of the proposed General Plan will result in increased demand for public services, including fire protection, law enforcement, schools, parks, libraries, and other public and governmental services. As the demand for public services and recreation increases, there will likely be a need to address acceptable service ratios, response times, and other performance standards. New or expanded service structures (e.g., offices, maintenance and administrative buildings, schools, parks, fire facilities, libraries, etc.) will be needed to provide for adequate staffing, equipment, and appropriate facilities to serve growth within the cumulative analysis area.

The General Plan includes a range of policies and actions that would ensure that public services are provided in a timely fashion, are adequately funded, are coordinated between the City and appropriate service agency, and that new development funds its fair share of services. The General Plan includes policies to ensure that fire protection and law enforcement services keep pace with new development and that school, library, and governmental services are adequately planned and provided. Payment of applicable impact fees, and ongoing revenues that would come from property taxes, sales taxes, and other revenues generated by the future projects, would ensure that the City maintains acceptable service ratios. The proposed General Plan's incremental contribution to cumulative public services and recreation impacts would be **less than cumulatively considerable**.

TRANSPORTATION AND CIRCULATION

Impact 4.14: Cumulative impacts on the transportation network (Less than Cumulatively Considerable)

Under Cumulative Plus Plan conditions, the Planning Area would generate approximately 830,313 daily trips on a typical weekday. As described in Section 3.14 (Transportation and Circulation), the residential and commuter VMT under the previous General Plan and the proposed General Plan Update for the City of Lake Forest are shown in Table 3.14-4 of Section 3.14 (Transportation and Circulation), as reproduced below in Table 4.0-5.

TABLE 4.0-5: CUMULATIVE (2040) VMT COMPARISON

STATISTIC	*PREVIOUS GENERAL PLAN*	*PROPOSED GENERAL PLAN UPDATE*	*CHANGE IN VMT PER RESIDENT/EMPLOYEE*
HOME-BASED VMT			
Home-Based Trip VMT	1,966,070	2,531,888	- 4.2%
Total Residents	102,567	137,776	
Home-Based VMT per Resident	*19.2*	*18.4*	
WORK-BASED VMT			
Work-Based Trip VMT	1,413,984	1,425,619	- 6.2%
Total Employees	62,193	66,775	
Work-Based VMT per Employee	*22.7*	*21.3*	

SOURCE: STANTEC, INC., 2019.

As shown in the above table, the General Plan Update is not expected to increase VMT per person above No Project/previous General Plan conditions. In fact, home-based VMT per resident is expected to decrease by 4% and work-based VMT per employee is expected to decrease by approximately 6% under the proposed General Plan Update. Part of this reduction could be attributed to the increasingly balanced mix of residential and employment opportunities within the City. Therefore, the proposed General Plan update is not expected to increase VMT per person above No Project conditions. Therefore, the VMT-related impacts of the Plan would be considered less than significant.

Additionally, Orange County CMP intersections were analyzed to identify potential impacts of the Plan on the CMP system. The LOS and v/c for the three CMP intersections in the study area are shown in Table 3.14-5 of Section 3.14 (Transportation and Circulation), and is reproduced below in Table 4.0-6.

TABLE 4.0-6: CUMULATIVE (2040) PLUS PLAN INTERSECTION LEVEL OF SERVICE (CMP INTERSECTIONS)

INTERSECTION		PEAK HOUR	EXISTING		2040 PLUS PLAN		CHANGE
			V/C	LOS	V/C	LOS	
17	El Toro Road & Trabuco Road	AM	0.62	B	0.68	B	0.06
		PM	0.60	A	0.69	B	0.09
38	El Toro Road & Bridger Road/I-5 NB Ramps	AM	0.63	B	0.78	C	0.15
		PM	0.66	B	0.96	E	0.30
39	El Toro Road & Avenida De La Carlota	AM	0.37	A	0.47	A	0.10
		PM	0.56	A	0.78	C	0.22

SOURCE: KITTELSON & ASSOCIATES, INC., 2019

As shown in Table 4.0-6, the CMP intersections are expected to operate acceptably (LOS E or better) under Cumulative (2040) Plus Project conditions. Therefore, the impacts of the Plan to CMP facilities would be considered less than significant. Additionally, development attributable to the General Plan would be expected to have no impact to air traffic. Furthermore, the General Plan does not contain any provisions that would increase hazards due to design features of incompatible uses. Lastly, the impact of the General Plan with respect to access to and performance of transit, bicycle, and pedestrian impacts would be considered **less than significant**. As a result, the General Plan's incremental contribution to cumulative transportation and circulation impacts would be **less than cumulatively considerable**.

UTILITIES

Impact 4.15: Cumulative impacts related to utilities (Less than Cumulatively Considerable)

Cumulative growth that would occur within the service areas for the IRWD, the ELWD, and the TCWD over the life of the proposed General Plan will result in increased demand for water service, sewer service, and solid waste disposal services.

Water: Table 3.15-4 summarizes annual projections of demands and supplies to meet those demands through 2040, as documented by West Yost Associates. The proposed General Plan includes a range of policies and actions designed to ensure an adequate water supply for development and to minimize the potential adverse effects of increased water use. Given that projected water demands associated with General Plan buildout would not exceed the projected available water (including after taking into account future development within Orange County, neighboring cities, and the broader region), and that the proposed General Plan includes a comprehensive set of goals, policies and actions to ensure an adequate and reliable source of clean potable water, impacts associated with water supplies are less than significant.

Additionally, future development in the Planning Area would be required to connect to existing water distribution infrastructure in the vicinity of each site, pay the applicable water system connection fees, and pay the applicable water usage rates. Future projects may be required to

implement site specific and limited off-site improvements to the water distribution system in order to connect new project sites to the City's existing water infrastructure network. The specific impacts of providing new and expanded waster distribution infrastructure cannot be determined at this time, as the General Plan does not propose any specific development projects or include details on any future development projects. However, any future improvements to the existing water distribution infrastructure would be primarily provided on sites with land use designations that allow for urbanized land uses, and the environmental impacts of constructing and operating the new water distribution infrastructure would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the proposed General Plan.

This Draft EIR addresses the potential impacts of development that may occur under the proposed General Plan, including residential, commercial, professional office, business park, light industrial, public facilities, and a range of other uses. As shown in Tables 3.15-1 and 3.15-2, the IRWD and the ETWD have adequate future supplies available to meet projected demand increases throughout their respective service areas through the year 2035 (2035 is the greatest future year for which these water districts have prepared supply/demand projections). As noted in Section 3.14, the TCWD customers are supplied with water from the IRWD.

Given that projected water demands associated with General Plan buildout would not exceed the projected water supplies, and that the proposed General Plan includes a comprehensive set of goals, policies, and actions to ensure an adequate and reliable source of clean potable water, impacts associated with water supplies are **less than cumulatively considerable.**

Wastewater: As with the water system, the City's sewer services are divided up by three utility districts, IRWD, ETWD, and TCWD. Among the three agencies, there are approximately 215 miles of sewer main within the borders of Lake Forest. As of 2008, the IRWD MWRP had a plant capacity of 18 mgd but it was recently expanded to a capacity of 28 mgd. As of 2014, the ETWD LAWRP had a plant capacity of 7.5 mgd but only approximately 3.43 mgd was being conveyed to the LAWRP for treatment. As discussed above, the only section of Lake Forest which TCWD provides wastewater services for is a portion of the Portola Hills community. The amount of flow capacity available to the Portola Hills Community is limited by the total capacity that TCWD owns in SMWD's wastewater collection system and the Chiquita Water Reclamation Plant. TCWD owns 0.558 mgd of capacity in SMWD's wastewater collection system and Chiquita Water Reclamation Plant. 0.428 mgd is reserved specifically for TCWD's El Toro Road Zone. Of the 0.428 mgd reserved for the El Toro Road Zone, 0.158 mgd is reserved for its Portola Hills customers.

As Lake Forest continues to develop in the future, there will be an increased need for water and wastewater services, including a reliable source of recycled water. These needs have been addressed in the district's master plans and will require that the Districts, in coordination with the City, continue to implement phased improvements to some pump stations, sewer mains, and the various wastewater treatment plants when triggered by growth.

The net average daily flow (ADF) wastewater impacts of the proposed Lake Forest 2040 General Plan Update can be seen in Table 3.15-6, as provided in Section 3.15 (Utilities), and as reproduced

as Table 4.0-7 below. The projected flows for each district are not expected to exceed the treatment capacity available for the Districts, assuming that the majority of the flow generated in the IRWD service area is conveyed to the LAWRP for treatment. There may be local infrastructure impacts for each of the focus areas. Sub-Area master plans or development impact studies will likely be required by IRWD and ETWD for each of the focus areas to determine infrastructure impacts.

TABLE 4.0-7. NET INCREASE IN WASTEWATER ADF FROM BAU CURRENT GENERAL PLAN BUILDOUT TO PROPOSED PLAN BUILDOUT

FOCUS AREA	*SERVICE*	*NET INCREASE IN ADF, GPD*
El Toro Road Corridor	ETWD	554,000
Lake Forest Drive Corridor	IRWD	547,000
Lake Forest Civic Center Area	IRWD	429,000
Foothill Ranch Towne Center	IRWD	848,000
Light Industrial/Rail Corridor	ETWD/IRWD	150,000

SOURCE: WEST YOST ASSOCIATES, 2018.

While full buildout of the proposed General Plan would slightly increase the treatment demand of the Districts' treatment plants, the proposed General Plan includes a range of policies and actions designed to ensure an adequate wastewater treatment capacity for development. As described above, the districts must also periodically review and update their Master Plans, and as growth continues to occur within the Planning Area, the districts, in coordination with the City, will identify necessary system upgrades and capacity enhancements to meet growth, prior to the approval of new development.

Given that projected wastewater generation volumes associated with General Plan buildout would not exceed the projected wastewater generation volumes described in the IRWD Master Plan and ETWD Master Plan, and that the proposed General Plan includes a comprehensive set of goals, policies, and actions to ensure an adequate and reliable wastewater collection and treatment system, impacts associated with wastewater treatment and compliance with waste discharge requirements are less than significant**.** The proposed General Plan's incremental contribution to cumulative wastewater impacts would be **less than cumulatively considerable**.

Stormwater: Development under the proposed General Plan would result in increased areas of impervious surfaces throughout the Planning Area, resulting in the need for additional or expanded stormwater drainage, conveyance, and retention infrastructure. The infrastructure and facilities necessary to serve new growth would involve development of some facilities on-site within new development projects, some facilities off-site on appropriately designated land, and may also involve improvements to existing facilities and disturbance of existing rights-of-way.

Stormwater drainage and conveyance facilities would be evaluated at the project-level in association with subsequent development projects. However, the facilities would be primarily provided on sites with land use designations that allow such uses and the environmental impacts

of constructing and operating the facilities would likely be similar to those associated with new development, redevelopment, and infrastructure projects under the General Plan.

As future development and infrastructure projects are considered by the City, each project will be evaluated for conformance with the General Plan, Municipal Code, and other applicable regulations. Subsequent development and infrastructure projects would also be analyzed for potential environmental impacts, consistent with the requirements of CEQA.

With the policies and actions listed in Section 3.15 (Utilities) would ensure that there is adequate stormwater drainage and flood control infrastructure to serve future development under the General Plan, and would ensure that future drainage and flood control infrastructure projects do not result in adverse environmental impacts. The proposed General Plan's incremental contribution to cumulative wastewater impacts would be **less than cumulatively considerable**.

Solid Waste: Development under the proposed General Plan may increase the population within the Planning Area to approximately 70,574 persons. The City of Lake Forest has achieved a disposal rate of 4.2 PPD per resident in 2019. Assuming these disposal rates remain constant throughout the life of the General Plan, the new growth under General Plan buildout would result in an increase of approximately 296,410.8 pounds per day of solid waste, which equals 148.2 tons per day or 54,093 tons of solid waste per year.

The City's annual increase in solid waste generation is well within the permitted capacity of the Frank R. Bowerman Sanitary Landfill. The vast majority (90%) of landfill disposed from the City of Lake Forest in 2017 (the latest year of information available) went to Frank R. Bowerman Sanitary Landfill. Other landfills that received relatively small amounts of waste from the City of Lake Forest in 2017 include:

- Antelope Valley Public Landfill (1 ton);
- Azusa Land Reclamation Co. Landfill (184 tons);
- El Sobrante Landfill (161 tons)
- McKittrick Waste Treatment Site (25 tons)
- Mid-Valley Sanitary Landfill (241 tons);
- Olinda Alpha Sanitary Landfill (223 tons);
- Prima Deshecha Sanitary Landfill (5,408 tons); and
- Simi Valley Landfill & Recycling Center (95 tons);

Frank R. Bowerman Sanitary Landfill has a remaining capacity of 87,384,799 cubic yards, and has an estimated cease operation date of December 31, 2058. This closure date is based on solid waste disposal projections for all jurisdictions served by the landfill.

Future projects within the Planning Area would be required to comply with applicable state and local requirements including those pertaining to solid waste, construction waste diversion, and recycling. While there is adequate permitted landfill capacity to accommodate future growth, the proposed General Plan includes actions to further reduce the project's impact on solid waste services. The General Plan would not exceed the permitted capacity of the landfill serving the City,

and the General Plan complies with regulations related to solid waste. The proposed General Plan's incremental contribution to cumulative solid waste impacts would be **less than cumulatively considerable**.

WILDFIRE

Impact 4.16: Cumulative impact related to wildfire (Less than Cumulatively Considerable)

The General Plan ensures that the City's emergency access routes, emergency contact lists, and public information regarding designated facilities and routes are regularly reviewed to ensure that up to date information is available to the City and the public in the event of an emergency. Important new critical facilities would also be located to ensure resiliency and functionality in the event of a natural disaster. Implementation of the General Plan would have a less than significant impact with regard to this issue.

No specific aspect as a result of implementation of the General Plan will substantially alter the slope, prevailing winds, or other factors that would increase exposure to Lake Forest residents, employees or visitors to increased pollutant concentrations from wildfire or result in the uncontrollable spread of a wildfire. General Plan implementation would not exacerbate wildfire risks in VHFHSZs; therefore, these impacts would be less than significant.

Furthermore, the Lake Forest General Plan is a long range policy document that does not include site specific designs or proposals, and does not propose any entitlements for development. The majority of all future development would occur within existing developed areas. However, future development may require the limited extension and development of infrastructure such as roads, water and sewer utilities, and fuel breaks into areas designated as VHFHSZ's. The potential for future projects to impact environmental resources to meet compliance with fire development standards such (as fuel breaks and clearance requirements) would require site specific environmental require under CEQA to identify any site-specific impacts. As demonstrated throughout this EIR, implementation of the various policies and actions contained in the General Plan would reduce potential impacts associated with the construction and expansion of infrastructure. Implementation of the General Plan policies and actions combined with local and state requirements, as discussed previously, would ensure that potential wildland fire hazards would not be exacerbated by local infrastructure, and this impact would be considered **less than significant**.

Lastly, while the City cannot state with certainty that future risks associated with post-fire flooding and debris flow would not occur in Lake Forest, implementation of the General Plan would not exacerbate this risk. Implementation of Action PS-2a would reduce this risk to the greatest extent feasible, resulting in an impact that is less than significant as a result of adoption and implementation of the proposed General Plan. Implementation of the policies and actions provided in Section 3.16 (Wildfire) would ensure that the proposed General Plan's incremental contribution to cumulative solid waste impacts would be **less than cumulatively considerable**.

4.2 GROWTH-INDUCING EFFECTS

INTRODUCTION

Section 15126.2(d) of the CEQA Guidelines requires that an EIR evaluate the growth-inducing impacts of a proposed action. A growth-inducing impact is defined by the CEQA Guidelines as:

> *The way in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth…It is not assumed that growth in an area is necessarily beneficial, detrimental, or of little significance to the environment.*

Based on the CEQA Guidelines, growth inducement is any growth that exceeds planned growth of an area and results in new development that would not have taken place without implementation of the project. A project can have direct and/or indirect growth inducement potential. Direct growth inducement would result if a project, for example, involved construction of new housing. A project would have indirect growth inducement potential if it established substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises) or if it would involve a construction effort with substantial short-term employment opportunities that would indirectly stimulate the need for additional housing and services to support the new employment demand *(Napa Citizens for Honest Government v. Napa County Board of Supervisors)*. Similarly, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service. A project providing an increased water supply in an area where water service historically limited growth could be considered growth-inducing.

The CEQA Guidelines further explain that the environmental effects of induced growth are considered indirect impacts of the proposed action. These indirect impacts or secondary effects of growth may result in significant, adverse environmental impacts. Potential secondary effects of growth include increased demand on other community and public services and infrastructure, increased traffic and noise, and adverse environmental impacts such as degradation of air and water quality, degradation or loss of plant and animal habitat, and conversion of agricultural and open space land to developed uses.

Growth inducement may constitute an adverse impact if the growth is not consistent with or accommodated by the land use plans and growth management plans and policies for the area affected. Local land use plans provide for land use development patterns and growth policies that allow for the orderly expansion of urban development supported by adequate urban public services, such as water supply, roadway infrastructure, sewer service, and solid waste service.

The General Plan is a long-term plan intended to accommodate projected population, housing, and employment growth, including the appropriate balance among these factors with the necessary public services and infrastructure. The proposed General Plan would serve as a comprehensive, long-term plan for the physical development of Lake Forest. Projected growth is described in

Section 3.10 (Land Use and Population), and the environmental consequences related to the potential growth are fully assessed in each topical section. By definition, the proposed Lake Forest General Plan is intended to provide for and address future growth in the City.

Because the proposed General Plan provides a framework for development through its Land Use Map, land use designations, goals, policies, and actions, it would directly induce population and employment growth in the Lake Forest Planning Area by designating land for development that is more intense, in some instances, than current designations allow. The analysis of the indirect growth-inducing impacts for the proposed General Plan focuses on the following factors: inducement of unanticipated population growth; encouragement of economic growth that leads to jobs and housing growth; elimination of obstacles to population growth; and resulting service, facility, or infrastructure demands in excess of existing and planned growth.

The proposed General Plan accommodates future growth in Lake Forest, including new businesses, expansion of existing businesses, and new residential uses. Infrastructure and services would need to accommodate future growth. The General Plan is oriented toward the economic growth of the City, with emphasis given to encouraging development of a broader array of businesses, increasing local employment opportunities, and providing residential development as necessary to serve economic growth. The cumulative development scenario addressed in this Draft EIR is the maximum projected development that could occur within the existing city limits and the Planning Area, if every parcel in the city and the Planning Area developed at or near the higher end of densities and intensities allowed under the proposed General Plan.

As shown in Table 2.0-2, buildout of the General Plan could yield up to 14,634 new housing units and 3,155,364 square feet of new non-residential building square footage within the Planning Area. Depending on growth rates, the actual growth during the life of the General Plan could be lower or higher, but would not exceed the theoretical maximum buildout described in Chapter 2.0.

Given the historical and current population, housing, and employment trends, growth in the City, as well as the entire state, is inevitable. The primary factors that account for population growth are natural increase and net migration. The average annual birth rate for California is expected to be 20 births per 1,000 population. Additionally, California is expected to attract more than one third of the country's immigrants. Other factors that affect growth include the cost of housing, the location of jobs, the economy, the climate, and transportation. While these factors would likely result in growth in Lake Forest during the planning period of the proposed General Plan, growth will continue to occur based primarily on the demand of the housing market and demand for new commercial, industrial, and other non-residential uses. As future development occurs under the proposed General Plan, new roads, infrastructure, and services would be necessary to serve the development and this infrastructure would accommodate planned growth. However, growth under the proposed General Plan would remain within the general growth levels projected statewide and would not be anticipated to exceed any applicable growth projections or limitations that have been adopted to avoid an environmental effect. The proposed General Plan is intended to accommodate the City's fair share of statewide housing needs, based on regional numbers

provided by the California Department of Housing and Community Development on a regular basis (every five to eight years).

The proposed General Plan includes policies and actions that mitigate environmental impacts associated with growth, such as air quality, noise, traffic, water supply, and water quality. Additionally, this Draft EIR identifies General Plan policies and actions, where appropriate, that would serve to reduce or eliminate potentially significant impacts associated with specific environmental issues associated with growth. Chapters 3.1 through 4.0 provide a discussion of environmental effects associated with development allowed under the proposed General Plan.

With implementation of General Plan policies and actions intended to guide growth to appropriate areas and provide services necessary to accommodate growth, the land uses allowed under the proposed General Plan, the infrastructure anticipated to accommodate proposed land uses, and the goal and policy framework would not induce growth that would exceed adopted thresholds. Therefore, population and housing growth associated with the proposed General Plan would result a **less than significant** impact.

4.3 SIGNIFICANT IRREVERSIBLE EFFECTS

LEGAL CONSIDERATIONS

CEQA Section 15126.2(c) and Public Resources Code Sections 21100(b)(2) and 21100.1(a), requires that the EIR include a discussion of significant irreversible environmental changes which would be involved in the proposed action should it be implemented. Irreversible environmental effects are described as:

- The project would involve a large commitment of nonrenewable resources;
- The primary and secondary impacts of a project would generally commit future generations to similar uses (e.g., a highway provides access to previously remote area);
- The project involves uses in which irreversible damage could result from any potential environmental accidents associated with the project; or
- The phasing of the proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy).

Determining whether the proposed project would result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed such that there would be little possibility of restoring them. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Consumption of Nonrenewable Resources

Consumption of nonrenewable resources refers to the loss of physical features within the natural environment, including the conversion of agricultural lands, loss of access to mining reserves, and nonrenewable energy use. The Lake Forest Planning Area has multiple nonrenewable resources, including biological resources, water resources, and energy resources.

One of the objectives of the proposed General Plan is to conserve natural resources within the Planning Area. Many of these policies and actions, aimed at preserving natural resources, are contained within the Recreation and Resources Element, and have been identified throughout this EIR. Additionally, the proposed General Plan directs most new development to infill areas, and areas surrounding existing neighborhoods and urbanized areas. As a result, the proposed General Plan will minimize the potential for impacts to the nonrenewable resources in the Planning Area, including biological resources, water resources, and energy resources, to the greatest extent feasible. More detailed and focused discussions of potential impacts to these nonrenewable resources are contained throughout this Draft EIR.

Nonrenewable energy resources such as electricity, natural gas, propane, gasoline, and diesel would be consumed during the construction and operation of development projects contemplated under the General Plan buildout. The proposed General Plan includes a variety of policies that seek to conserve, protect, and enhance energy resources. These policies focus on energy efficiency in the design, materials, construction, and use of buildings, the use of alternative energy systems, and alternative transportation modes.

Irretrievable Commitments/Irreversible Physical Changes

Implementation of the proposed General Plan would result in a commitment of land uses designated for the foreseeable future. Land use and development consistent with the General Plan would result in irretrievable commitments by introducing development onto sites that are presently undeveloped. The conversion of agricultural lands to urban uses would result in an irretrievable loss of agricultural land, wildlife habitat, and open space. Additionally, development will physically change the environment in terms of aesthetics, air emission, noise, traffic, open space, and natural resources. These physical changes are irreversible after development occurs. Therefore, the proposed General Plan would result in changes in land use within the Planning Area that would commit future generations to these uses.

Impact 4.17: Irreversible effects (Significant and Unavoidable)

In summary, the proposed General Plan includes an extensive policy framework that is designed to address land use and environmental issues to the greatest extent feasible, while allowing growth and economic prosperity for the City. However, even with the policies and actions that will serve to reduce potential significant impacts, the proposed General Plan will result in significant irreversible changes. This impact is considered a **significant and unavoidable** impact under CEQA.

4.4 SIGNIFICANT AND UNAVOIDABLE IMPACTS

CEQA Guidelines Section 15126.2(b) requires an EIR to discuss unavoidable significant environmental effects, including those that can be mitigated but not reduced to a level of insignificance. The following significant and unavoidable impacts of the General Plan are discussed in Chapter 3 and previously in this chapter (cumulative-level). Refer to those discussions for further details and analysis of the significant and unavoidable impacts identified below:

- **Impact 3.2-1:** General Plan implementation would result in the conversion of farmlands, including Prime Farmland and Unique Farmland, to non-agricultural use (Significant and Unavoidable)
- **Impact 3.3-2**: General Plan implementation would result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard (Significant and Unavoidable)
- **Impact 3.3-3**: General Plan implementation would expose sensitive receptors to substantial pollutant concentrations (Significant and Unavoidable)
- **Impact 3.3-4**: General Plan implementation would result in other emissions (such as those leading to odors adversely affecting a substantial number of people) (Significant and Unavoidable)
- **Impact 3.8-6**: General Plan implementation has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires (Significant and Unavoidable)
- **Impact 4.2:** Cumulative Impact to Agricultural Lands and Resources (Considerable Contribution and Significant and Unavoidable)
- **Impact 4.3:** Cumulative Impact on the Region's Air Quality (Considerable Contribution and Significant and Unavoidable)
- **Impact 4.8:** Cumulative impacts from hazardous materials and human health risks. (Considerable Contribution and Significant and Unavoidable)
- **Impact 4.17:** Irreversible Effects (Significant and Unavoidable)

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5.1 CEQA REQUIREMENTS

CEQA requires that an EIR analyze a reasonable range of feasible alternatives that meet most or all of the project objectives while potentially reducing or avoiding one or more environmental effects of the project. The range of alternatives required in an EIR is governed by a "rule of reason" that requires an EIR to set forth only those alternatives necessary to permit a reasoned choice (CEQA Guidelines Section 15126.6[f]). Where a potential alternative was examined but not chosen as one of the range of alternatives, the CEQA Guidelines require that the EIR briefly discuss the reasons the alternative was dismissed.

Alternatives that are evaluated in the EIR must be potentially feasible alternatives. However, not all possible alternatives need to be analyzed. An EIR must "set forth only those alternatives necessary to permit a reasoned choice." (CEQA Guidelines, Section 15126.6(f).) The CEQA Guidelines provide a definition for a "range of reasonable alternatives" and, thus limit the number and type of alternatives that need to be evaluated in an EIR. An EIR need not include any action alternatives inconsistent with the lead agency's fundamental underlying purpose in proposing a project. (*In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143, 1166.)

First and foremost, alternatives in an EIR must be potentially feasible. In the context of CEQA, "feasible" is defined as:

> *… capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.* (CEQA Guidelines 15364)

5.2 ALTERNATIVES CONSIDERED IN THIS EIR

FACTORS GUIDING SELECTION OF ALTERNATIVES

A Notice of Preparation was circulated to the public to solicit recommendations for a reasonable range of alternatives to the proposed project. Additionally, a public scoping meeting was held during the public review period to solicit recommendations for a reasonable range of alternatives to the proposed project. No specific alternatives were recommended by commenting agencies or the general public during the NOP public review and comment period.

The alternatives to the General Plan Update selected for analysis in the EIR were developed to minimize significant environmental impacts while fulfilling the basic objectives of the project, and address public and elected officials' input with respect to potential land use and growth scenarios that may be appropriate for consideration as part of the General Plan Update. Significant impacts are summarized in Chapter 4.0 and described in greater detail in Sections 3.1 through 3.16. As described in Chapter 2.0 (Project Description), the following objectives have been identified for the proposed project:

1. Reflect the current goals and vision expressed by city residents, businesses, decision-makers, and other stakeholders;
2. Address issues and concerns identified by city residents, businesses, decision-makers, and other stakeholders;
3. Protect Lake Forest's family-oriented environment, character, and sense of community;
4. Provide a range of high-quality housing options;
5. Attract and retain businesses and industries that provide high-quality and high-paying jobs so that residents can live and work in Lake Forest;
6. Expand retail shopping opportunities to provide better local services and increased sales tax revenues;
7. Continue to maintain the road network and improve multimodal transportation opportunities;
8. Maintain strong fiscal sustainability and continue to provide efficient and adequate public services; and
9. Address new requirements of State law.

SIGNIFICANT AND UNAVOIDABLE IMPACTS

The proposed General Plan Update would result in the following significant and unavoidable impacts, which are described in Sections 3.1 through 3.16 and Chapter 4.0:

- **Impact 3.2-1:** General Plan implementation would result in the conversion of farmlands, including Prime Farmland and Unique Farmland, to non-agricultural use.
- **Impact 3.3-2**: General Plan implementation would result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
- **Impact 3.3-3**: General Plan implementation would expose sensitive receptors to substantial pollutant concentrations.
- **Impact 3.3-4**: General Plan implementation would result in other emissions (such as those leading to odors adversely affecting a substantial number of people).
- **Impact 3.8-6**: General Plan implementation has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires.
- **Impact 4.2:** Cumulative impact to agricultural lands and resources.
- **Impact 4.3:** Cumulative impact on the region's air quality.
- **Impact 4.8:** Cumulative impacts from hazardous materials and human health risks.
- **Impact 4.17:** Irreversible effects.

ALTERNATIVES TO THE GENERAL PLAN UPDATE

Three alternatives to the General Plan Update were considered based on the analysis performed to identify the environmental effects of the proposed project. Since the General Plan Update was prepared with the intent to be a self-mitigating document, project alternatives focused on amending land uses to potentially address impacts. The alternatives analyzed in this EIR include the following:

- **Alternative 1: No Project Alternative**. Under Alternative 1, the City would not adopt the General Plan Update. The existing Lake Forest General Plan would continue to be implemented and no changes to the General Plan, including the Land Use Map, Circulation Diagram, goals, policies, or actions would occur. Subsequent projects, such as amending the Municipal Code (including the zoning map) and the City's Design Guidelines, would not occur. The existing General Plan Land Use Map is shown on Figure 3.10-3 in Chapter 3.10.

- **Alternative 2: Reduced Mixed Growth Alternative**. Alternative 2 continues to provide for a balance of job-creating and residential development land uses in mixed-use focus areas throughout the City, but at residential densities and nonresidential intensities lower than those reflected in the Proposed General Plan. This Alternative is defined by three major changes from the Proposed General Plan:

    1. Elimination of the Mixed-Use 60 (MU-60) land use designation; in Alternative 2, areas previously designated as MU-60 are designated as land uses with lower densities and intensities such as Mixed-Use 43 (MU-43) or Commercial.
    2. Increased amount of land designated for Urban Industrial 25 (UI-25); in Alternative 2, limited areas in the Civic Center and Lake Forest Drive focus areas previously designed as Mixed-Use 32 (MU-32) or MU-43 (allowing for residential and commercial development) are designated as UI-25, allowing for a broader mix of uses which includes industrial development at densities and intensities equal to or less than the Proposed General Plan.
    3. Reduced amount of land designated for Mixed-Use designations in the El Toro Road Focus Area; in Alternative 2, the El Toro Road Focus Area only allows Mixed-Use development (per the MU-43 designation) in the area between I-5 and Rockfield Boulevard and maintains the area's current Commercial, Professional Office, and Public Facility designations on parcels in the Focus Area north of Rockfield Boulevard.

  This alternative would result in less residential and nonresidential growth than the Proposed General Plan, but more growth than Alternative 1, the existing General Plan, and less residential, but more nonresidential growth than Alternative 3 (High Density Residential Alternative). This alternative was developed to potentially reduce the severity of significant impacts associated with air quality, and hazards, as well as the potential further reduction in less than significant impacts related to aesthetics, and public services and utilities.

  Figure 5.0-1 depicts the Land Use Map proposed for Alternative 2

- **Alternative 3: High Density Residential Alternative**. Alternative 3 would revise the General Plan Land Use Map to place more emphasis on identifying specific areas for high density residential land uses, allowing for densities up to 43 du/ac, in mixed-use

and non-mixed-use configurations, such as MU-43 and High Density Residential (HDR). This Alternative is defined by three major changes from the Proposed General Plan:

1. Elimination of the MU-60 land use designation; in Alternative 3, areas previously designated as MU-60 are designated as MU-43 allowing for residential densities up to 43/du acre, consistent with the maximum density allowed by the City's HDR land use designation.
2. Elimination of the MU-32 land use designation; in Alternative 3, areas previously designated as MU-32 are designated as MU-43 or HDR, both allowing for up to 43 du/ac.
3. Elimination of the UI-43 land use designation; in Alternative 3, areas previously designated as UI-43 are designated as HDR.

This alternative emphasizes high density residential development, with a decreased emphasis on commercial development and business expansion in an effort to achieve a jobs-housing balance closer to 1.0. This alternative was developed to potentially reduce the severity of less than significant impacts related to aesthetics, noise, public services and utilities.

Figure 5.0-2 depicts the Land Use Map proposed for Alternative 3.

A summary of the growth projections, including population growth, housing units, jobs, and the resultant job/housing balance for the project and each alternative is shown in Table 5.0-1.

TABLE 5.0-1: GROWTH PROJECTIONS BY ALTERNATIVE

ALTERNATIVE	*DWELLING UNITS*	*POPULATION*	*NON-RESIDENTIAL SQUARE FEET OF DEVELOPMENT*	*JOBS*	*JOBS PER HOUSING UNIT*
EXISTING CONDITIONS					
City/Planning Area	*28,928*	*81,888*	*15,315,700*	*38,039*	*1.31*
NEW GROWTH					
Proposed General Plan	22,406	70,574	12,410,885	14,202	-
Alternative 1: Existing General Plan/No Project	7,772	27,110	10,761,520	10,170	-
Alternative 2: Reduced Mixed Growth Alternative	18,826	60,186	12,032,188	12,853	-
Alternative 3: High Density Residential Alternative	22,027	69,691	11,997,105	13,345	-
TOTAL BUILDOUT GROWTH: EXISTING PLUS NEW GROWTH					
Proposed General Plan	51,334	152,462	27,726,585	52,241	1.02
Alternative 1: Existing General Plan/No Project	36,700	108,998	26,077,220	48,209	1.31
Alternative 2: Reduced Mixed Growth Alternative	47,745	142,074	27,347,888	50,892	1.07
Alternative 3: High Density Residential Alternative	50,955	151,579	27,312,805	51,384	1.01

SOURCE: DE NOVO PLANNING GROUP, 2019

5.3 ENVIRONMENTAL ANALYSIS

The alternatives analysis provides a summary of the relative impact level of significance associated with each alternative for each of the environmental issue areas analyzed in this EIR. Following the analysis of each alternative, Table 5.0-5 summarizes the comparative effects of each alternative.

The primary difference between the proposed General Plan and Alternatives 2 and 3 are the Land Use Maps associated with each of these alternatives. The goals, policies, and actions contained in the proposed General Plan would also apply and be implemented under Alternatives 2 and 3. Therefore, changes to the Land Use Map are the only variables that may increase or decrease the severity of one or more of the significant environmental impacts identified in this Draft EIR. It is important to note, however, that all of the Land Use Maps, across all of the Alternatives analyzed in this EIR, include essentially the same urban footprint. In other words, none of the Alternatives introduce new urban land uses within areas of the City that are not already designated for such uses by the existing General Plan.

Throughout the preparation of the General Plan Update, the City Council, Planning Commission, and Working Group all expressed a desire and commitment to ensuring that the General Plan not only reflect the community's values and priorities, but also serve as a self-mitigating document and avoid significant environmental impacts to the greatest extent feasible. To further this goal of crafting a self-mitigating General Plan, the environmental analysis contained in this Draft EIR was completed concurrently with the development of the General Plan elements and Land Use Map in order to foster informed decision making regarding the Land Use Map and the General Plan goals, policies, and actions as they were being developed. As the Land Use Map was crafted, refined, and revised throughout the course of the General Plan Update, changes were made on a continuous basis in order to incrementally and substantially reduce potentially significant environmental impacts that were identified. The result of this approach and this process is a proposed General Plan Land Use Map that has reduced potentially significant impacts to the environment, while still meeting the project objectives identified by the City of Lake Forest.

As demonstrated in the discussion below, the Alternative 2 General Plan Land Use Map is the environmentally superior alternative, as it was developed and refined to reduce as many environmental effects as possible, while still meeting all of the project objectives.

ALTERNATIVE 1 - NO PROJECT

Under Alternative 1, the City would continue to implement the existing General Plan and no changes would be made to address updated General Plan Guidelines, or the requirements of State law. Since adoption of the existing General Plan, State legislation has been passed requiring the City to address new safety and circulation requirements in the General Plan and to further address greenhouse gas emissions. Additionally, while the City currently has a certified Housing Element, it will be required to update its Housing Element and receive new State certification by October 2021, and the existing General Plan does not conform to state

requirements regarding planning for future housing growth. The General Plan goals, policies, and actions, as well as the Land Use Map, would not be updated to address the vision and concerns of the City's residents, property owners, decision-makers, and other stakeholders that actively participated in the visioning and goal and policy development process.

Alternative 1 would result in the continuation of existing conditions and development levels, as described in Chapter 3.10 (Land Use and Population) and as shown in Table 2.0-3 in Chapter 2.0 (Project Description). New growth would be allowed as envisioned under the existing General Plan, with land uses required to be consistent with the existing General Plan Land Use Map as shown on Figure 3.10-3 in Chapter 3.10. Table 5.0-2 shows the acreages of each land use designation for the existing General Plan Land Use Map compared to the proposed Land Use Map.

TABLE 5.0-2: ALTERNATIVE 1 V. PROPOSED GENERAL PLAN LAND USE DESIGNATIONS COMPARISON

LAND USE DESIGNATION	*PROPOSED PROJECT - GENERAL PLAN UPDATE (ACRES)*	*ALTERNATIVE 1 – NO PROJECT (ACRES)*	*DIFFERENCE*
RESIDENTIAL LAND USES			
Very Low Density Residential	-	-	0
Low Density Residential	2,499	2,387	-112
Low-Medium Density Residential	880	934	54
Medium Density Residential	361	390	29
High Density Residential	16	16	0
Residential Subtotal	*3,756*	*3,727*	*-29*
NON-RESIDENTIAL LAND USES			
Commercial	280	562	282
Professional Office	8	30	22
Business Park	298	348	50
Light Industrial	627	731	358
Public Facility	373	373	0
Non-Residential Subtotal	*1,586*	*2,044*	*458*
MIXED-USE LAND USES			
Mixed-Use 32	101	-	-101
Mixed-Use 43	295	130	-165
Mixed-Use 60	68	-	-68
Mixed-Use Office	24	-	-24
Urban Industrial 25	52	-	-52
Urban Industrial 43	26	-	-26
Mixed-Use Subtotal	*566*	*130*	*-436*
LIMITED DEVELOPMENT LAND USES			
Community Park/Open Space	249	257	8
Regional Park/Open Space	1,939	1,939	0
Open Space	877	875	-2
Lake	58	58	0
Transportation Corridor	30	101	71

LAND USE DESIGNATION	*PROPOSED PROJECT - GENERAL PLAN UPDATE (ACRES)*	*ALTERNATIVE 1 – NO PROJECT (ACRES)*	*DIFFERENCE*
Right-of-Way	1,681	1,611	-70
Limited Development Subtotal	*4,834*	*4,841*	*-3*
Totals	**10,742**	**10,742**	**0**

SOURCE: DE NOVO PLANNING GROUP, 2019

As shown in Table 5.0-2, Alternative 1 would provide for approximately 458 additional acres of non-residential land uses (commercial, professional office, business park, light industrial, and public facility) within the Planning Area, approximately 436 fewer acres of mixed land use, and a total of 29 fewer total acres of residential land uses (including 112 fewer acres of low density residential uses). Alternative 1 offers fewer acres of and opportunities to develop mixed use pedestrian-oriented land uses within the city when compared to the proposed Land Use Map.

As shown in Table 5.0-1, Alternative 1 would result in increased housing and job growth within the Lake Forest city limits when compared to existing conditions, but substantially less overall growth than all other alternatives.

Under Alternative 1 at full buildout, there would be an increase over existing conditions in residential growth (approximately 7,772 dwelling units) and jobs (approximately 10,170 jobs) within City limits. Under cumulative conditions, development in Planning Area combined under Alternative 1 would result in a population of 108,998 and 48,209 jobs. Under Alternative 1, the existing General Plan policy framework would still be in effect, which would constitute a status quo approach to land use regulation in the City. The Proposed Land Use Map, along with the policy framework proposed by the General Plan Update, encourages and aims to achieve a community with a balanced land use pattern that meets the City's long-term housing, employment, and civic needs. The land uses allowed under the proposed General Plan provide opportunities for cohesive new growth at in-fill locations within existing urbanized areas of the city, as well as new growth adjacent to existing urbanized areas. A mix and balance of uses to provide an improved ratio of local jobs to population, would ensure that development pays its fair-share of necessary roadway, public service, and other infrastructure improvements, and that provides for increased protection of natural resources would occur. The proposed General Plan was prepared in conformance with State laws and regulations associated with the preparation of general plans, including requirements for environmental protection.

Alternative 1 would not include updated policies, particularly those related to housing, greenhouse gases, and complete streets policies to address safety, access, and mobility for all roadway users, as required by State law. This alternative would not include various policies proposed in the General Plan update to ensure protection of environmental resources, both at a project level and under cumulative conditions, consistent with the objectives of CEQA.

Alternative 1 fails to meet several of the basic project objectives, including the following: 1. Reflect the current goals and vision expressed by City residents, businesses, decision-makers, and other stakeholders; 2. Address issues and concerns identified by City residents, businesses,

decision-makers, and other stakeholders; 4. Provide a range of high-quality housing options; 7. Continue to maintain the road network and improve multimodal transportation opportunities; and 9. Address new requirements of State law.

Therefore, Alternative 1 (No Project) is rejected from further consideration as a CEQA alternative, as it fails to meet several of the project objectives. However, for reference, the environmental effects associated with Alternative 1 are discussed and summarized in Table 5.0-5 to provide a general comparison between the adopted Lake Forest General Plan (Alternative 1 – No Project), the proposed project, and Alternatives 2 and 3.

ALTERNATIVE 2 – REDUCED MIXED GROWTH ALTERNATIVE

Alternative 2 would revise the General Plan Land Use Map to place more emphasis on providing for a balance of job-creating and residential development land uses in mixed-use focus areas throughout the City, but at residential densities and nonresidential growth rates lower than those reflected in the proposed General Plan. Alternative 2 would result in less residential and nonresidential growth than the proposed General Plan, but it would contemplate more growth than Alternative 1, the existing General Plan, and less residential but slightly more nonresidential growth than Alternative 3 (High Density Residential Alternative).

Land use designations under Alternative 2 would be modified as shown on Figure 5.0-1 and summarized in Table 5.0-3 which includes the elimination of the Mixed-Use 60 (MU-60) land use designation for lower densities and intensity uses such as Mixed-Use 43 (MU-43) or Commercial, an increased amount of land designated for Urban Industrial 25 (UI-25), and an overall reduction in the amount of Mixed-Use development along El Toro Road adjacent to I-5.

The goals, policies, and actions of the General Plan Update would apply to subsequent development, planning, and infrastructure projects under this alternative.

As shown in Table 5.0-1, Alternative 2 would result in approximately 3,580 fewer housing units and 10,406 fewer residents within Lake Forest when compared to the proposed General Plan Land Use Map. Nonresidential square feet would be reduced by 378,697 square feet and employment opportunities would be decreased under this alternative, with approximately 1,349 fewer jobs created within the city limits when compared to the proposed General Plan.

As shown in Table 5.0-3, Alternative 2 would provide for approximately 64 fewer acres of mixed land uses, and approximately 65 more acres of commercial development within the City, when compared to the Proposed Land Use Map.

TABLE 5.0-3: ALTERNATIVE 2 V. PROPOSED GENERAL PLAN LAND USE DESIGNATIONS COMPARISON

LAND USE DESIGNATION	*PROPOSED PROJECT - GENERAL PLAN UPDATE (ACRES)*	*ALTERNATIVE 2 – REDUCED MIXED GROWTH ALTERNATIVE (ACRES)*	*DIFFERENCE*
RESIDENTIAL LAND USES			
Very Low Density Residential	-	-	0
Low Density Residential	2,499	2,499	0
Low-Medium Density Residential	880	880	0
Medium Density Residential	361	361	0
High Density Residential	16	16	0
Residential Subtotal	*3,756*	*3,756*	*0*
NON-RESIDENTIAL LAND USES			
Commercial	280	341	61
Professional Office	8	12	4
Business Park	298	298	0
Light Industrial	627	627	0
Public Facility	373	373	0
Non-Residential Subtotal	*1,586*	*1,651*	*65*
MIXED-USE LAND USES			
Mixed-Use 32	101	49	-52
Mixed-Use 43	295	312	17
Mixed-Use 60	68	-	-68
Mixed-Use Office	24	24	0
Urban Industrial 25	52	95	43
Urban Industrial 43	26	22	-4
Mixed-Use Subtotal	*566*	*502*	*-64*
LIMITED DEVELOPMENT LAND USES			
Community Park/Open Space	249	249	0
Regional Park/Open Space	1,939	1,939	0
Open Space	877	877	0
Lake	58	58	0
Transportation Corridor	30	30	0
Right-of-Way	1,681	1,679	-2
Limited Development Subtotal	*4,834*	*4,832*	*-2*
Totals	**10,742**	**10,742**	**0**

SOURCE: DE NOVO PLANNING GROUP, 2019

Aesthetics

As described in Chapter 3.1 (Aesthetics and Visual Resources) impacts related to Aesthetics were found be less than significant. The Planning area is largely urbanized and developed. Therefore, development would generally occur on either vacant, infill parcels, or on parcels where redevelopment potential exists. Future development would result in densification of urban uses. The proposed General Plan and Alternative 2 would allow for an increase in intensity and density of the existing land uses than is currently allowed. However, as noted above, this alternative would likely result in decreased densities and intensities and subsequent reduced

building heights in the Planning area. The reduced development potential under this alternative as compared to the Proposed General plan would result in decreased building heights and decreased densities in the Planning Area. Visual impacts would be slightly reduced compared to the Proposed General Plan. Maximum densities under Alternative 2 would be similar to Alternative 3, and aesthetic impacts would generally be similar under both of these alternatives. The No Project Alternative (Alternative 1) would include lower densities and intensity than all other alternatives and therefore, may have slightly reduced impacts to aesthetics and visual resources.

Agriculture and Forest Resources

As described in Impact 3.2-1 of Chapter 3.2, the proposed General Plan would result in significant and unavoidable impacts related to the conversion of farmlands, including Prime Farmland and Unique Farmland, to non-agricultural use.

All Project Alternatives would result in general plan land use designations that would result in similar development patterns on Important Farmlands. The loss of the agricultural land, including prime farmland, would result in a significant and unavoidable impact under all project alternatives. Therefore, the impact level under all scenarios would remain the same.

However, the existing zoning map currently designated lands for agricultural uses within several areas of the City that have a Land Use designation for non-agricultural uses. In other words, the existing (and all Alternative versions) of the Land Use Map have inconsistencies with the existing Zoning Map. The proposed General Plan includes policies and actions that would require the Zoning Code and Zoning Map to be updated, consistent with the land uses planned under the proposed General plan and therefore may indirectly increase this impact. This impact would remain significant and unavoidable under all of the Alternatives.

Air Quality

As described in Chapter 3.3 (Air Quality) construction and operation of future developments will occur within close proximity to sensitive receptors, and there is the potential for localized emissions to exceed regulatory levels. The following significant impacts related to air quality have been identified:

- Impact 3.3-2: General Plan implementation would result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
- Impact 3.3-3: General Plan implementation would expose sensitive receptors to substantial pollutant concentrations.
- Impact 3.3-4: General Plan implementation would result in substantial regional emissions.
- Impact 4.3: General Plan implementation would contribute to cumulative impacts on the region's air quality.

While land uses and development under Alternative 2 would be required to adhere to the same policy guidance and local, state, and regional air quality measures as the Proposed General Plan, the decrease in residential units and non-residential building square footage, and the corresponding reduction in construction emissions, operational emission, and potential reductions in overall traffic volumes would result in reductions in air emissions under Alternative 2 when compared to the proposed General Plan and Alternative 3. Under the No Build Alternative, the Planning Area would experience significantly less development, and there would be reduced construction and operational emissions compared to all other alternatives.

Biological Resources

There are various biological resources, including habitat, that occurs throughout the region. As described in Chapter 3.4 (Biological Resources) General Plan implementation would result in less than significant impacts to biological resources. Approval of the General Plan would not directly approve or entitle any development or infrastructure projects. However, implementation of the General Plan and Land Use Map would allow and facilitate future development in Lake Forest, which could result in adverse impacts to special-status plant and wildlife species, as well as sensitive natural habitat or wildlife movement corridors. Subsequent development projects will be required to comply with the General Plan and adopted Federal, State, and local regulations for the protection of special status plants and animals, including habitat. The City of Lake Forest has prepared the proposed General Plan to include numerous policies and actions intended to protect special status plants and animals, including habitat, from adverse effects associated with future development and improvement projects.

All Project Alternatives would result in similar development patterns. The proposed General Plan and Alternatives 2 and 3 would also include updated biological policies and actions aimed at protecting biological resources (as described in detail in Chapter 3.4). Therefore, impacts to biological resources under Alternative 2 would remain the same when compared to the proposed General Plan and Alternative 3. However, because Alternative 2 would update conservation, and biological resource policies consistent with the Proposed General Plan, impacts to biological resources would be slightly reduced when compared to the No Project Alternative, which does not include an updated policy document.

Cultural and Tribal Cultural Resources

As described in Chapter 3.5 (Cultural and Tribal Cultural Resources) General Plan implementation would result in less than significant impacts to cultural and tribal cultural resources.

All Project Alternatives would result in similar development patterns and a similar development footprint. However, because Alternative 2 would update cultural resource policies to include new policies and actions related to agency coordination, consultation, and monitoring consistent with the proposed General Plan Policy Document (and Alternative 3), impacts to cultural resources would be slightly reduced when compared to the No Project Alternative which does not include additional and updated policies related to cultural resources. The impact

under all other scenarios (the Proposed General Plan, and Alternatives 2 and 3) would remain the same.

Greenhouse Gas Emissions and Energy

As described in Chapter 3.7 (Greenhouse Gas Emissions and Energy), the proposed General Plan would result in less than significant impacts to Greenhouse Gases, Climate Change, and Energy.

As stated in Chapter 3.7, the proposed General Plan is consistent with the CEQA Guidelines Section 15183.5 framework for developing a plan to reduce GHG emissions. The City of Lake Forest would not exceed the per capita GHG emission targets established to ensure compliance with SB 32 and other California legislation for future year 2030 and General Plan buildout year 2040. Based on forecasted population levels for each forecast year and the results provided in the preceding tables, after taking into account federal and state actions (i.e. as provided under the Legislative-adjusted BAU Plus Proposed Project scenarios), per capita emissions are estimated to decline from 5.18 MT CO2e to 2.83 MT CO2e in year 2030 (derived by dividing 320,954 MT CO2e by a projected 2030 year population of 113,401), 2.43 MT CO2e in year 2040 (derived by dividing 650,834 MT CO2e by a projected 2040 year population of 152,462). Moreover, the proposed General Plan includes a range of goals and policies that would reduce GHG emissions.

Under Alternative 2, the Planning Area would be developed with similar uses as the Proposed General Plan, but the total dwelling units, population and jobs increases would be slightly reduced. The decrease in total residential unit count and population may decrease the total greenhouse gas emissions and energy use, however, density reductions would generally be seen to increase per capita GHG emissions levels. As such, the greenhouse gas emissions impact is increased slightly under Alternative 2 when compared to the proposed General Plan. Moreover, when compared to Alternative 1 (No Project), the Proposed General Plan, Alternative 2 and Alternative 3 all include a range of goals and policies that would reduce GHG emissions, including policies to encourage mixed-use development, complete streets and multi modal improvements that would further reduce per capita GHG impacts. When compared to Alternative 1 (No Project), the proposed General Plan and Alternatives 2 and 3 present substantially more opportunities for trip internalization and increased opportunities for walking and bicycling due to their proposed mix of higher density residential, office, retail, and other uses under increased mixed-use designations. Therefore, impacts related to greenhouse gases, climate change and energy resources would also be reduced (under all other alternatives) when compared to the No Project Alternative which does not include an updated policy document, or an update land use map that prioritizes mixed uses and higher densities and intensities.

Geology

As described in Chapter 3.6 (Geology), the proposed General Plan would result in less than significant impacts to Geology and Soils. All alternatives would result in similar development patterns. The proposed General Plan and Alternatives 2 and 3 would also include updated policies related to geologic hazards, including requirements for project reviews and standards for construction and building practices (as described in detail in Chapter 3.6).

All future projects within the Planning Area will be required to comply with state laws including the preparation of stormwater plans, and compliance with the provisions of the California Building Standards Code (CBSC), which requires development projects to perform geotechnical investigations in accordance with State law, engineer improvements to address potential seismic and ground failure issues, and use earthquake-resistant construction techniques to address potential earthquake loads when constructing buildings and improvements. Therefore, impacts related to Geology and Soils would generally remain the same under all alternatives. However, the updated policy document provides for additional policies and action related to geologic hazards and safety when compared to the existing General Plan, therefore the proposed General Plan and Alternatives 2 and 3 would be considered to be slightly superior to the Alternative 1.

Hazards and Hazardous Materials

As described in Chapter 3.8 (Hazards and Hazardous Materials), all impacts related to hazardous materials, aircraft hazards, and emergency response were found to be less than significant. Impact 3.8-6 was found to be significant and unavoidable as the proposed General Plan has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires.

The proposed General Plan and Alternative 2 would include updated policies and actions aimed at protecting the public from hazardous materials. These policies and actions in the General Plan would ensure that potential hazards are identified on a project site, that development is located in areas where potential exposure to hazards and hazardous materials can be mitigated to an acceptable level, and that business operations comply with Federal and State regulations regarding the use, transport, storage, and disposal of hazardous materials. The proposed General Plan also includes policies and actions to ensure that the City has adequate emergency response plans and measures to respond in the event of an accidental release of a hazardous substance. (as described in detail in Chapter 3.8).

All Project alternatives would result in additional urban uses including commercial, industrial, residential, and mixed-use and public facility development. Impacts related to hazards and hazardous materials, emergency response under Alternative 2 would remain the same when compared to the proposed General Plan.

Impact 3.8-6 in Chapter 3.8 was found to be significant and unavoidable as the proposed General Plan has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires. There is no feasible mitigation available to reduce this impact to a less than significant level. Implementation of the Proposed General Plan's policies and actions combined with local and state requirements discussed previously would ensure that potential wildland fire hazards to people and structures is mitigated to the greatest extent feasible. However, the City cannot state with certainty that this impact would be reduced to a less than significant level.

As described previously, all alternatives would result in development patterns that include future development of urban uses in areas designated as high fire hazard severity zones. Therefore, this would result in a significant and unavoidable impact under all alternatives as all designate existing and developable lands within areas of high fire concern. The impact under all scenarios would remain similar, however reduce development allowed under Alternative 2 and Alternative 1 (No Project) would reduce the total number of people potentially exposed to injury or death in the event of an uncontrolled wildfire.

Hydrology and Water Quality

As described in Chapter 3.9 (Hydrology and Water Quality), under all impact areas, implementation of the proposed General Plan would result in less than significant impacts related to Hydrology and Water Quality.

All of the alternatives generally would allow development to occur in a manner similar to the proposed General Plan within a highly urbanized environment, where flood control and water quality protection measures are well established and enforced. This variation in intensity and land use designation changes would not substantially alter impacts from or to flooding, water quality, or on groundwater supplies because existing federal, State, and local regulations would apply to guard against flood hazards, water quality contamination, or impact on groundwater supplies. Impact for each alternative, like the proposed project, would be less than significant.

Alternative 2 would result in slightly reduced development of housing units and non-residential square feet when compared to the proposed General Plan. Compared to the proposed General Plan, the potential water quality impacts related to construction and operation would be similar. As described in Chapter 3.9, General Plan implementation would not result in construction, or long-term impacts to surface water quality from urban stormwater runoff. All alternatives would also be required to submit a SWPPP with BMPs to the RWQCB and comply with all storm water sewer system (MS4) requirements. It would be expected that impacts related to water quality would be similar under Alternatives 2 and Alternative 3 as compared to the Proposed General Plan. The implementation of the General Plan policies and actions which includes policies aimed to enhance stormwater quality and infiltration as well as actions to review development projects to identify potential stormwater and drainage impacts and require development to include measures to ensure off-site runoff is not increased as a beyond pre-development levels would not be updated and included under Alternative 1 as this alternative does not include an update to the General Plan Policy Document to include updated policies related to permeable surfaces onsite detention, and infiltration. Therefore, this impact under the No-Project Alternative may be slightly increased when compared to all other alternatives.

Land Use Planning and Population/Housing

The proposed General Plan and Alternative 2 are long-range land use plans. As described in Chapter 3.10 (Land Use, Population, and Housing) all impacts related to land use, population, and housing were found to be less than significant under the Proposed General Plan. As described previously, the proposed General Plan and Alternatives 2 would include adoption of the updated policy document consistent with the Proposed General Plan. Therefore, Alternative

2 would also result in the same impact level as the proposed General Plan. Alternative 2 would update current land use designations, and the City's General Plan would be more effective in promoting and encouraging more compact urban development and revitalization through mixed use development. In addition, numerous programs and policies within the Proposed General Plan's policy document allow for greater consistency with applicable state and regional plans versus the existing General Plan, and would also promote efficiency in the delivery of urban services, and local agency coordination. Finally, the amount and typology of allowable development under the Proposed General Plan, and Alternative 2 has been crafted to meet City's Regional Housing Needs Allocation (RHNA) for future housing needs. Continuation of the existing General Plan and its Housing Element would not enable the City to meet its RHNA obligation for new State certification by October 2021. In all, Alternative 1 (No Project Alternative) would result in less consistency with pertinent state and regional plans relative to the proposed General Plan and when compared to all other alternatives.

Mineral Resources

As described in Chapter 3.11, the proposed General Plan would result in less than significant impacts relating mineral resources. All of the alternatives, like the Proposed General Plan, accommodate development generally in the same areas, and these areas are, for the most part, either already urbanized or in an open space land use. Given that no mineral resources would be impacted by the proposed project, impacts associated with each of the alternatives would be the same and all would remain less than significant.

Noise

As described in Chapter 3.12, the proposed General Plan would not result in significant cumulative noise impacts. Buildout of the General Plan would contribute to transportation noise and in increases in traffic noise levels at existing sensitive receptors. As indicated by Table 3.12-15, the related traffic noise level increases with a 20-year circulation system buildout of the proposed General Plan are predicted to increase between 0.1 to 2.1 dB versus the existing General Plan. With buildout of the circulation system under the proposed General Plan traffic noise increases are predicted to be between 0.1 to 3.6 dB versus the existing General Plan, as shown in Table 3.12-16. The proposed General Plan and Alternative 2 include General Plan Policies intended to minimize exposure to excessive noise, including noise associated with traffic. Specifically, Policies PS-6.1 and PS-6b support noise-compatible land uses in the vicinity of traffic noise sources and require that new development and infrastructure projects be reviewed for consistency with the noise standards. Additional policies would ensure that new development mitigates potential noise impacts through incorporating the noise control treatments necessary to achieve acceptable noise levels and sets criteria for evaluating future increases in traffic noise levels.

Alternative 2 would result in slightly fewer residential developments, reduced numbers of jobs, and slightly reduced traffic. As such, noise impacts would be slightly reduced under Alternative 2 when compared to the proposed General Plan.

Public Services and Recreation

As described in Chapter 3.13, the proposed General Plan would result in less than significant impacts relating to public services and recreation. New development would place increased demands on public services such as police, fire, schools, parks, libraries, and other governmental services. The proposed General Plan includes policies and actions that require payment of impact fees to the City and other public agencies to ensure that additional development allowed does not have adverse impacts on these services and agencies.

Under Alternative 2, the development area and development types would remain similar, however, there would be slightly fewer jobs, dwelling units, and reduced population increase when compared to the Propose General Plan and thus, impacts to public services (the demand for police, fire and other public services) would be slightly reduced. Overall, Alternative 2 would have a slightly reduced impact to public services when compared to the proposed project and Alternative 3, and a greater impact when compared to Alternative 1 as Alternative 1 would include the least amounts of growth and subsequent demand for services or the need to additional services.

Transportation

As described in Chapter 3.14 (Transportation and Circulation), the proposed General Plan would result in less than significant impacts to the circulation network. The residential and commuter VMT under the proposed General Plan is not expected to increase VMT per person above the No Project/Existing General Plan conditions. In fact, home-based VMT per resident is expected to decrease by 4% and work-based VMT per employee is expected to decrease by approximately 6% under the proposed General Plan Update when compared to Alternative 1 (No Project). Part of this reduction is attributed to the increasingly balanced mix of residential and employment opportunities within the city with the proposed General Plan Update. Alternative 2 also includes a more balanced mix of uses as part of mixed-use developments and additional opportunities for increased densities as part of mixed-use developments which includes opportunities for trip internalization, and increased opportunities for walking and bicycling. Overall, Alternative 2 would slightly reduce densities as part of mixed-use developments when compared to the Proposed General Plan, therefore this alternative would have slightly increased impacts relative to per capita VMT when compacted to the Proposed General Plan.

Utilities and Service Systems

As described in Chapter 3.15, the proposed General Plan would result in less than significant impacts relating Utilities.

New development would place increased demands on utilities. Under Alternative 2, the Planning Area would be developed with a similar development patterns and uses as the Proposed General Plan, however, the overall residential intensity/density, and job increases would be reduced slightly. The quantity of infrastructure installed would not be substantially reduced, as all alternatives would require similar development patterns and footprints, but the

demand for utility services, including wastewater and solid waste services would be less than would be required under the Proposed General Plan.

Separately, the total storm drainage runoff under Alternative 2 would be approximately the same when compared to the proposed project, due to the general development footprint remaining the same for this alternative when compared to the proposed General Plan.

Therefore, demand for utilities would be slightly less under this alternative when compared to the proposed General Plan and Alternative 3, and a greater impact when compared to Alternative 1 as Alternative 1 would include the least amount of growth and subsequent demand for utility services.

Wildfire

Impact 3.8-6 was found to be significant and unavoidable as the proposed General Plan has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires as a result of existing and future development t located within areas of high fire hazard severity.

As described in Chapter 3.16 (Wildfire), the proposed General Plan would result in less than significant impacts relating to all other Wildfire impacts. All alternatives would result in similar development patterns and a similar development footprint. However because Alternative 2 would update policies to include new policies and actions related to agency coordination, consultation, and monitoring consistent with the proposed General Plan (and Alternative 3), impacts related to wildfire impacts would be slightly reduced when compared to the No Project Alternative, which does not include additional and updated policies and actions aimed reducing the risk of wildfire hazards. The impact under all other scenarios (the Proposed General Plan, and Alternatives 2 and 3) would remain the same.

Irreversible Effects

The proposed project would have a significant and unavoidable impact associated with irreversible environmental effects as described under Impact 4.17. Implementation of the proposed General Plan would result in a commitment of land uses designated for the foreseeable future. Land use and development consistent with the General Plan would result in irretrievable commitments by introducing development onto sites that are presently undeveloped. The conversion of agricultural lands to urban uses would result in an irretrievable loss of agricultural land, wildlife habitat, and open space. Additionally, development will physically change the environment in terms of aesthetics, air emission, noise, traffic, open space, and natural resources. These physical changes are irreversible after development occurs. Therefore, the proposed General Plan would result in changes in land use within the Planning Area that would commit future generations to these uses.

During the planning horizon, development under Alternative 2 would be reduced in comparison to the proposed General Plan. Under cumulative conditions, Alternative 2 would result in less residential and less non-residential floor area (see Table 5.0-1). Alternative 2 would use

nonrenewable resources, including metals, stone, and other materials related to construction, and result in on-going demand for fossil fuels and other resources associated with energy production at levels greater than the proposed project. The associated irretrievable commitment of nonrenewable resources and permanent conversion of agricultural, and other undeveloped lands under Alternative 2 would remain a significant impact. Alternative 2 would have slightly reduced impact in comparison to the proposed General Plan due to reduced development levels.

ALTERNATIVE 3 – HIGH DENSITY RESIDENTIAL ALTERNATIVE

Alternative 3 (High Density Residential Alternative) provides for a balance of job-creating and residential development land uses within the City, and has slightly reduced amounts of growth when compared the proposed General Plan, but would allow substantially more residential development compared to the existing Genera Plan.

As described previously, Alternative 3 would revise the General Plan Land Use Map to place more emphasis on identifying specific areas for high density residential land uses, allowing for densities up to 43 du/ac, in mixed-use and non-mixed-use configurations, such as MU-43 and High Density Residential (HDR). The goals, policies, and actions of the General Plan Update would apply to subsequent development, planning and infrastructure projects under this alternative. As described previously this alternative is defined by three major changes from the Proposed General Plan:

1. Elimination of the MU-60 land use designation; in Alternative 3, areas previously designated as MU-60 are designated as MU-43 allowing for residential densities up to 43/du acre, consistent with the maximum density allowed by the City's HDR land use designation.

2. Elimination of the MU-32 land use designation; in Alternative 3, areas previously designated as MU-32 are designated as MU-43 or HDR, both allowing for up to 43 du/ac.

3. Elimination of the UI-43 land use designation; in Alternative 3, areas previously designated as UI-43 are designated as HDR.

Alternative 3 reflects areas identified for growth through the General Plan Update, but provides for more residential-only development than the existing General Plan or Alternative 2.

As shown in Table 5.0-1, Alternative 3 would result in approximately 379 fewer housing units within the city when compared to the proposed General Plan Land Use Map. Employment opportunities would also decrease under this alternative, with approximately 857 fewer jobs created within the city limits when compared to the proposed General Plan.

Under full buildout conditions, this alternative would result in a total population within the Planning Area of approximately 151,579, which is slightly lower than the total population projection of 152,462 under the proposed General Plan.

As shown in Table 5.0-4, Alternative 3 would provide for approximately 45 more acres of High Density Residential land uses, and 45 fewer acres of mixed-use lands within the city, when compared to the proposed Land Use Map.

TABLE 5.0-4: ALTERNATIVE 3 V. PROPOSED GENERAL PLAN LAND USE DESIGNATIONS COMPARISON

LAND USE DESIGNATION	*PROPOSED PROJECT - GENERAL PLAN UPDATE (ACRES)*	*ALTERNATIVE 3 – HIGH DENSITY RESIDENTIAL ALTERNATIVE (ACRES)*	*DIFFERENCE*
RESIDENTIAL LAND USES			
Very Low Density Residential	-	-	0
Low Density Residential	2,499	2,499	0
Low-Medium Density Residential	880	880	0
Medium Density Residential	361	361	0
High Density Residential	16	61	45
Residential Subtotal	*3,756*	*3,801*	*45*
NON-RESIDENTIAL LAND USES			
Commercial	280	280	0
Professional Office	8	8	0
Business Park	298	298	0
Light Industrial	627	627	0
Public Facility	373	373	0
Non-Residential Subtotal	*1,586*	*1,586*	*0*
MIXED-USE LAND USES			
Mixed-Use 32	101	0	-101
Mixed-Use 43	295	445	150
Mixed-Use 60	68	0	-68
Mixed-Use Office	24	24	0
Urban Industrial 25	52	52	0
Urban Industrial 43	26	0	-26
Mixed-Use Subtotal	*566*	*521*	*-45*
LIMITED DEVELOPMENT LAND USES			
Community Park/Open Space	249	249	0
Regional Park/Open Space	1,939	1,939	0
Open Space	877	877	0
Lake	58	58	0
Transportation Corridor	30	30	0
Right-of-Way	1,681	1,681	0
Limited Development Subtotal	*4,834*	*4,834*	*0*
Totals	**10,742**	**10,742**	**0**

Source: De Novo Planning Group, 2019

Aesthetics

As described in Chapter 3.1 (Aesthetics and Visual Resources), impacts related to aesthetics were found be less than significant. The Planning Area is largely urbanized and developed. Therefore, development would generally occur on either vacant, infill parcels, or on parcels where redevelopment potential exists. Future development would result in densification of urban uses. The proposed General Plan and Alternative 3 would allow for a greater increase in intensity and density of existing lands than is currently allowed. However, as noted above, this alternative would result in a slightly reduced overall development level in the Planning area when compared to the Proposed General Plan. The reduced development potential under this alternative as compared to the Proposed General plan would result in decreased building heights decreased densities in the Planning Area and visual impacts associated with increase building height and bulk would be reduced compared to the Proposed General Plan. Maximum densities under Alternative 3 would be similar to Alternative 2, and aesthetic impacts would generally be similar under both these alternatives.

Agriculture and Forest Resources

As described in Impact 3.2-1 of Chapter 3.2, the proposed General Plan would result in significant and unavoidable impacts related to the conversion of farmlands, including Prime Farmland and Unique Farmland, to non- agricultural use.

All Project Alternatives would result in similar development patterns on Important Farmlands. The loss of the agricultural land, including Prime Farmland, would result in a significant and unavoidable impact under all project alternatives. Therefore, the impact under all alternatives would remain the same.

Air Quality

As described in Chapter 3.2 (Air Quality) construction and operation of future development will occur within close proximity to sensitive receptors, and there is the potential for localized emissions to exceed regulatory levels. The following significant impacts related to air quality have been identified:

- Impact 3.3-2: General Plan implementation would result in a cumulatively considerable net increase of criteria pollutants for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
- Impact 3.3-3: General Plan implementation would expose sensitive receptors to substantial pollutant concentrations.
- Impact 3.3-4: General Plan implementation would result in substantial regional emissions.
- Impact 4.3: General Plan implementation would contribute to cumulative impacts on the region's air quality.

Land uses and development under Alternative 3 would be required to adhere to the same policy guidance and local, state, and regional air quality measures as the proposed General Plan. Slight decreases in residential units and non-residential building square footage, and the corresponding reduction in construction and operational emission, would result in reductions in air emissions. However, potential reductions in overall traffic volumes and per capita VMT would be expected to be greater under Alternative 3 when compared to the proposed General Plan, and therefore may offset reductions due to reduced construction and operation impacts. When compared to the proposed Project and Alternative 3 impacts would be substantially similar.

Biological Resources

There are various biological resources, including habitat, that occurs throughout the region. As described in Chapter 3.4 (Biological Resources), General Plan implementation would result in less than significant impacts to biological resources. Approval of the General Plan would not directly approve or entitle any development or infrastructure projects. However, implementation of the General Plan and Land Use Map would allow and facilitate future development in Lake Forest, which could result in adverse impacts to special-status plant and wildlife species, as well as sensitive natural habitat or wildlife movement corridors. Subsequent development projects will be required to comply with the General Plan and adopted Federal, State, and local regulations for the protection of special status plants and animals, including habitat. The City of Lake Forest has prepared the General Plan to include numerous policies and actions intended to protect special status plants and animals, including habitat, from adverse effects associated with future development and improvement projects.

All Project Alternatives would result in similar citywide development patterns. The proposed General Plan and Alternatives 2 and 3 would also include updated biological policies and actions aimed at protecting biological resources (as described in detail in Chapter 3.4). Therefore, impacts to biological resources under Alternative 3 would remain the same when compared to the proposed General Plan and Alternative 2. However, because Alternative 3 would update conservation and biological resource policies, consistent with the Proposed General Plan, impacts to biological resources would be slightly reduced when compared to the No Project Alternative, which does not include an updated policy document.

Cultural and Tribal Cultural Resources

As described in Chapter 3.5 (Cultural and Tribal Cultural Resources), General Plan implementation would result in less than significant impacts to cultural and tribal cultural resources. All Project alternatives would result in similar development patterns and a similar development footprint. However, because Alternative 3 would update cultural resource policies to include new policies and actions related to agency coordination, consultation, and monitoring consistent with the Proposed General Plan's Policy Document, impacts to cultural resources would be slightly reduced when compared to the No Project Alternative, which does not include additional and updated policies related to cultural resources. The impact under all other scenarios (the Proposed General Plan, and Alternatives 2 and 3) would remain the same.

Greenhouse Gas Emissions and Energy

As described in Chapter 3.7 (Greenhouse Gas Emissions and Energy), the proposed General Plan would result in less than significant impacts to greenhouse gases, climate change, and energy.

As stated in Chapter 3.7, the proposed General Plan is consistent with the CEQA Guidelines Section 15183.5 framework for developing a plan to reduce GHG emissions. The City of Lake Forest would not exceed the per capita GHG emission targets established to ensure compliance with SB 32 and other California legislation for future year 2030 and General Plan buildout year 2040. Based on forecasted population levels for each forecast year and the results provided in the preceding tables, after taking into account federal and state actions (i.e. as provided under the Legislative-adjusted BAU Plus Proposed Project scenarios), per capita emissions are estimated to decline from 5.18 MT CO2e to 2.83 MT CO2e in year 2030 (derived by dividing 320,954 MT CO2e by a projected 2030 year population of 113,401), 2.43 MT CO2e in year 2040 (derived by dividing 650,834 MT CO2e by a projected 2040 year population of 152,462). Moreover, the proposed project includes a range of goals and policies that would reduce GHG emissions.

Under Alternative 3, the Planning Area would be developed with similar uses as the proposed General Plan and Alternative 2, but the total dwelling units, population and jobs increases would be slightly reduced compared to the Proposed General Plan. The decrease in total residential unit count and population may decrease the total greenhouse gas emissions and energy use, however, density reductions and the reductions in mixed use developments under Alternative 3 would generally be seen to increase for per capita GHG. As such, the greenhouse gas emissions impact is increased slightly when compared to the proposed General Plan and Alternative 2. Moreover, when compared to Alternative 1 (no project), the proposed General Plan, Alternative 3, and Alternative 2 include a range of goals and policies that would reduce GHG emissions, including policies to encourage mixed-use development, complete streets and multi modal improvements that would further reduce per capita GHG and VMT impacts. When compared to Alternative 1 (no project), the proposed General Plan and Alternatives 2, and 3 present substantially more opportunities for trip internalization and increased opportunities for walking and bicycling due to their proposed mix of higher density residential, office, retail, and other uses under increased mixed-use designations. Therefore, impacts related to greenhouse gases, climate change and energy resources would also be reduced (under all other alternatives) when compared to the No Project Alternative, which does not include an updated policy document, or an update land use map that prioritizes mixed uses and higher densities and intensities.

Geology

As described in Chapter 3.6 (Geology), the proposed General Plan would result in less than significant impacts to geology and soils. All Project alternative would result in similar development patterns. The Proposed General Plan, and Alternatives 3 and 2 would also include updated policies related to geologic hazards, including requirements for project review and standards for construction and building practices (as described in detail in Chapter 3.6).

All future projects within the Planning Area will be required to comply with state laws including the preparation of stormwater plans, and compliance with the provisions of the California Building Standards Code (CBSC), which requires development projects to perform geotechnical investigations in accordance with State law, engineer improvements to address potential seismic and ground failure issues, and use earthquake-resistant construction techniques to address potential earthquake loads when constructing buildings and improvements. Therefore, impacts related to geology and soils would generally remain the same under all alternatives. However, the updated policy document provides for additional policies and actions related to geologic hazards and safety when compared to the existing General Plan, therefore the proposed General Plan and Alternatives 2 and 3 would be considered to be slightly superior to the Alternative 1.

Hazards and Hazardous Materials

As described in Chapter 3.8 (Hazards and Hazardous materials), all impacts related to hazardous materials, aircraft hazards, and emergency response were found to be less than significant. Impact 3.8-6 was found to be significant as the proposed General Plan has the potential to expose people or structures to a significant risk involving wildland fires.

The proposed General Plan and Alternative 3 would include updated policies and actions aimed at protecting the public from hazardous materials. These policies and actions in the General Plan would ensure that potential hazards are identified on a project site, that development is located in areas where potential exposure to hazards and hazardous materials can be mitigated to an acceptable level, and that business operations comply with Federal and State regulations regarding the use, transport, storage, and disposal of hazardous materials. The proposed General Plan also includes policies and actions to ensure that the City has adequate emergency response plans and measures to respond in the event of an accidental release of a hazardous substance. (as described in detail in Chapter 3.8).

All alternatives would result in additional urban uses including commercial, industrial, residential, mixed-uses, and public facility development. The proposed General Plan and Alternative 2 differ slightly from Alternative 3 in that Alternative 3 includes less mixed use development opportunities which could potentially reduce residents' exposure to chemicals from delivery, cleaning, and other business related processes. This, however, would not be considered a significant difference. Therefore, impacts related to hazards and hazardous materials under Alternative 3 would be similar when compared to the proposed General Plan and Alternative 2.

Impact 3.8-6 was found to be significant as the proposed General Plan has the potential to expose people or structures to a significant risk involving wildland fires. Implementation of the proposed General Plan's policies and actions combined with local and state requirements (discussed in detail in Chapter 3.8) would ensure that potential wildland fire hazards to people and structures is mitigated to the greatest extent feasible. However, the City cannot state with certainty that this impact would be reduced to a less than significant level.

As described previously, all alternatives would result development patterns which includes future development of urban uses in areas designated as high fire hazard severity zones. Therefore, this would result in a significant and unavoidable impact under all project alternatives, as all designate existing and developable lands within areas of high fire concern. The impact under all scenarios would remain similar.

Hydrology and Water Quality

As described in Chapter 3.9 (Hydrology and Water Quality), implementation of the proposed General Plan would result in less than significant impacts related to hydrology and water quality.

All of the alternatives generally would allow development to occur in a manner similar to the proposed General Plan within a highly urbanized environment, where flood control and water quality protection measures are well established and enforced. This variation in intensity and land use designation changes would not substantially alter impacts from or to flooding, water quality, or on groundwater supplies because existing Federal, State, and local regulations would apply to guard against flood hazards, water quality contamination, or impacts on groundwater supplies. Impacts for each alternative, like the proposed project, would be less than significant.

Alternative 3 would result in slightly reduced development of housing units and non-residential square feet when compared to the Proposed General Plan. Compared to the Proposed General Plan, the potential water quality impacts related to construction and operation would be similar. As described in Chapter 3.9, General Plan implementation would not result in construction, or long-term impacts to surface water quality from urban stormwater runoff. Future development projects, under all alternatives, would also be required to submit a SWPPP with BMPs to the RWQCB and comply with all storm water sewer system (MS4) requirements. It would be expected that impacts related to water quality would be similar under Alternatives 2 and 3 as compared to the Proposed General Plan. The implementation of the General Plan policies and actions, which include policies aimed to enhance stormwater quality and infiltration as well as actions to review development projects to identify potential stormwater and drainage impacts, and require development to include measures to ensure off-site runoff is not increased beyond pre-development levels would not be updated and included under Alternative 1, as this alternative does not include a update top the General Plan Policy Document to include updated policies related to permeable surfaces onsite detention, and infiltration. Therefore, this impact under the No Project Alternative may be slightly increased when compared to all other alternatives.

Land Use Planning and Population/Housing

The proposed General Plan and Alternative 3 are long-range land use plans. As described in Chapter 3.10 (Land Use, Population, and Housing), all impacts related to land use, population, and housing were found to be less than significant under the proposed General Plan. As described previously, the proposed General Plan and Alternative 3 would include adoption of the updated policy document. Therefore, Alternative 3 would result in the same impact level as the Proposed General Plan. Alternative 3 would update current land use designations, and the updated General Plan would be more effective than Alternative 3 in promoting and encouraging

more compact urban development and revitalization through additional opportunities for high density residential development. In addition, numerous programs and policies within the Proposed General Plan's policy document allow for greater consistency with applicable state and regional plans versus the existing General Plan and would promote efficiency in the delivery of urban services, and local agency coordination. Finally, the amount and typology of allowable development under the Proposed General Plan, and Alternative 3 has been crafted with a mind to meeting the City's obligation to meet its Regional Housing Needs Allocation (RHNA) for future housing needs. Continuation of the existing General Plan and its housing element would not enable the City to meet its RHNA obligation for new State certification by October 2021. In all, Alternative 1 (No Project Alternative) would result in less consistency with pertinent state and regional plans relative to the proposed General Plan when compared to all other alternatives.

Mineral Resources

As described in Chapter 3.11, the proposed General Plan would result in less than significant impacts relating mineral resources. All of the alternatives, like the Proposed General Plan, accommodate development generally in the same areas, and these areas are for the most part already urbanized. Given that no mineral resources would be impacted by the proposed project, impacts associated with each of the alternatives would be the same, and all would remain less than significant.

Noise

As described in Chapter 3.12, the proposed General Plan would not result in significant cumulative noise impacts. Buildout of the General Plan would contribute to transportation noise and in increases in traffic noise levels at existing sensitive receptors. As indicated by Table 3.12-15, the related traffic noise level increases with a 20-year circulation system buildout of the proposed General Plan are predicted to increase between 0.1 to 2.1 dB versus the existing General Plan. With buildout of the circulation system under the proposed General Plan traffic noise increases are predicted to be between 0.1 to 3.6 dB versus the existing General Plan, as shown in Table 3.12-16. The proposed General Plan and Alternative 3 include General Plan policies intended to minimize exposure to excessive noise, including noise associated with traffic. Specifically, Policies PS-6.1 and PS-6b support noise-compatible land uses in the vicinity of traffic noise sources and require that new development and infrastructure projects be reviewed for consistency with the noise standards. Additional policies would ensure that new development mitigates potential noise impacts through incorporating the noise control treatments necessary to achieve acceptable noise levels and sets criteria for evaluating future increases in traffic noise levels.

Alternative 3 would result in slightly fewer residential developments, reduced numbers of jobs, and slightly reduced traffic. As such, noise impacts would be slightly reduced under this alternative when compared to the proposed General Plan.

Public Services and Recreation

As described in Chapter 3.13, the proposed General Plan would result in less than significant impacts relating public services and recreation. New development would place increased demands on public services such as police, fire, schools, parks, libraries, and other governmental services. The proposed General Plan includes policies and actions that require payment of impact fees to the City and other public agencies to ensure that additional development allowed does not have adverse impacts on these services and agencies.

Under Alternative 3, the development area and development types would remain similar, however, there would be slightly fewer jobs, dwelling units, and reduced population increase when compared to the proposed General Plan and thus, impacts to public services (the demand for police, fire and other public services) would be substantially similar to the proposed General Plan.

Transportation

As described in Chapter 3.14 (Transportation and Circulation), the proposed General Plan would result in less than significant impacts to the circulation network. The residential and commuter VMT under proposed General Plan is not expected to increase VMT per person above the No Project/Existing General Plan conditions. Home-based VMT per resident is expected to decrease by 4% and work-based VMT per employee is expected to decrease by approximately 6% under the proposed General Plan Update when compared to Alternative 1 (No Project). Part of this reduction is attributed to the increasingly balanced mix of residential and employment opportunities within the City with the proposed General Plan Update. Alternative 3 includes opportunities for increased densities, however, this alternative includes reduced opportunities for walking and bicycling than the proposed General Plan and Alternative 2 which include higher density and residential, office, retail, and other uses under increased areas of mixed-use designations. Overall Alternative 3 would slightly reduce densities and would reduce the amount of mixed-use developments when compared to the proposed General Plan and Alternative 2, therefore this alternative would have slightly increased impacts as it would be expected that per capita VMT would be slightly increased under this alternative.

Utilities

As described in Chapter 3.15, the proposed General Plan would result in less than significant impacts relating to utilities.

New development would place increased demands on utilities. Under Alternative 3, the Planning Area would be developed with similar development patterns and uses as the proposed General Plan, however, the overall residential intensity/density, and job increases would be reduced only slightly. The quantity of infrastructure installed would not be substantially reduced as all alternatives would require similar development patterns and footprints, but the demand for utility services including wastewater and solid waste services would be slightly less than would be required under the proposed General Plan.

Separately, the total storm drainage runoff under this alternative would be approximately the same when compared to the proposed project, due to the general development footprint remaining the same for this alternative when compared to the proposed General Plan.

Therefore, demand for utilities would be substantially similar under Alternative 3 when compared to the proposed project, and a greater impact when compared to Alternatives 1 and 2 which include less overall development and would include the least amounts of growth and subsequent demand for utility services.

Wildfire

Impact 3.8-6 was found to be significant as the proposed General Plan has the potential to expose people or structures to a significant risk of loss, injury or death involving wildland fires as a result of existing and future development t located within areas of high fire hazard severity.

As described in Chapter 3.16 (Wildfire), the proposed General Plan would result in less than significant impacts relating to all other wildfire impacts. All alternatives would result in similar development patterns and a similar development footprints. However because Alternative 3 would update policies to include new policies and actions related to agency coordination, consultation, and monitoring consistent with the proposed General Plan Policy Document, impacts related to wildfire would be slightly reduced when compared to the No Project Alternative, which does not include additional and updated policies and actions aimed reducing the risk of wildfire hazards. The impact under all other scenarios (the Proposed General Plan, and Alternatives 2 and 3) would remain the same.

Irreversible Effects

The proposed General Plan would have a significant and unavoidable impact associated with irreversible environmental effects as described under Impact 4.17. Implementation of the proposed General Plan would result in a commitment of land uses designated for the foreseeable future. Land use and development consistent with the General Plan would result in irretrievable commitments by introducing development onto sites that are presently undeveloped. The conversion of agricultural lands to urban uses would result in an irretrievable loss of agricultural land, wildlife habitat, and open space. Additionally, development will physically change the environment in terms of aesthetics, air emission, noise, traffic, open space, and natural resources. These physical changes are irreversible after development occurs. Therefore, the proposed General Plan would result in changes in land use within the Planning Area that would commit future generations to these uses.

During the planning horizon, development under Alternative 3 would be similar in comparison to the proposed General Plan. Under cumulative conditions, Alternative 3 would result roughly equal residential development and slightly reduced non-residential floor area (see Table 5.0-1). Alternative 3 would use nonrenewable resources, including metals, stone, and other materials related to construction, and result in on-going demand for fossil fuels and other resources associated with energy production at levels greater than the proposed project. The associated irretrievable commitment of nonrenewable resources and permanent conversion of agricultural,

and other undeveloped lands under Alternative 2 would remain a significant impact. Alternative 3 would have similar impacts in comparison to the proposed General Plan.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires that an environmentally superior alternative be identified among the alternatives that are analyzed in the EIR. If the No Project Alternative is the environmentally superior alternative, an EIR must also identify an environmentally superior alternative among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)). The environmentally superior alternative is that alternative with the least adverse environmental impacts when compared to the proposed General Plan.

A comparative analysis of the proposed General Plan and each of the Project alternatives is provided in Table 5.0-5 below. The table includes a numerical scoring system, which assigns a score of 1 to 5 to each of the alternatives with respect to how each alternative compares to the proposed project in terms of the severity of the environmental topics addressed in this EIR. A score of "3" indicates that the alternative would have the same level of impact when compared to the proposed project. A score of "1" indicates that the alternative would have a better (or reduced) impact when compared to the proposed project. A Score of "2" indicates that the alternative would have a slightly better (or slightly reduced) impact when compared to the proposed project. A score of "4" indicates that the alternative would have a slightly worse (or slightly increased) impact when compared to the proposed project. A score of "5" indicates that the alternative would have a worse (or increased) impact when compared to the proposed project. The project alternative with the lowest total score is considered the environmentally superior alternative.

As shown in Table 5.0-5, Alternative 2 (Reduced Mixed Growth Alternative) is the environmentally superior alternative when looked at in terms of all potential environmental impacts. While Alternative 3 has the same score as the Proposed General Plan, Alternative 3 fails to reduce the severity of any of the significant and unavoidable impacts of the proposed project and scores lower compared to Alternative 2. All of the alternatives fail to reduce any significant and unavoidable impacts to a less than significant level. Throughout the preparation of the General Plan Update, the City Council, Planning Commission, and GPAC all expressed a desire and commitment to ensuring that the General Plan not only reflect the community's values and priorities, but also serve as a self-mitigating document and avoid significant environmental impacts to the greatest extent feasible. To that end, the proposed General Plan includes the fully range of feasible mitigation available to reduce potential impacts to the greatest extent possible.

TABLE 5.0-5: COMPARISON OF ALTERNATIVES TO THE PROPOSED PROJECT

ENVIRONMENTAL ISSUE	*PROPOSED PROJECT*	*ALTERNATIVE 1 (NO PROJECT)*	*ALTERNATIVE 2 (MIXED)*	*ALTERNATIVE 3 (HDR)*
Aesthetics	3 Same	1 – Better	2 – Slightly Better	2 – Slightly Better
Agricultural Resources	3 – Same	3 – Same	3 – Same	3 - Same
Air Quality	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Biological Resources	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Cultural Resources	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Geology and Soils	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Greenhouse Gases, Climate Change, and Energy	3 – Same	5 – Worse	4 – Slightly Worse	4 – Slightly Worse
Hazards and Hazardous Materials	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Hydrology and Water Quality	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Land Use and Population	3 – Same	4 – Slightly Worse	3 – Same	3 – Same
Noise	3 – Same	1 – Better	2 – Slightly Better	2 – Slightly Better
Public Services and Recreation	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Transportation and Circulation	3 – Same	5 – Worse	4 – Slightly Worse	4 – Slightly Worse
Utilities	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
Wildfire	3 – Same	3 – Same	3 – Same	3 – Same
Irreversible Effects	3 – Same	2 – Slightly Better	2 – Slightly Better	3 – Same
SUMMARY	**48**	**48**	**44**	**48**

Overall, Alternative 2 is the environmentally superior alternative as it is the most effective in terms of overall reductions of impacts compared to the proposed General Plan and all other alternatives. As such, Alternative 2 is the environmentally superior alternative for the purposes of this EIR analysis. Additionally, similar to the Proposed General Plan, Alternative 2 meets all project objectives. Like the proposed project, Alternative 2 reflects the current goals and vision expressed by city residents, businesses, decision-makers, and other stakeholders; addresses issues and concerns identified by city residents, businesses, decision-makers, and other stakeholders; protects Lake Forest's family-oriented environment, character, and sense of community; provides a range of high-quality housing options; attracts and retains businesses and industries that provide high-quality and high-paying jobs so that residents can live and work in Lake Forest; expands retail shopping opportunities to provide better local services and increased sales tax revenues; continues to maintain the road network and improve multimodal transportation opportunities; maintains strong fiscal sustainability; continues to provide efficient and adequate public services; and addresses new requirements of State law.

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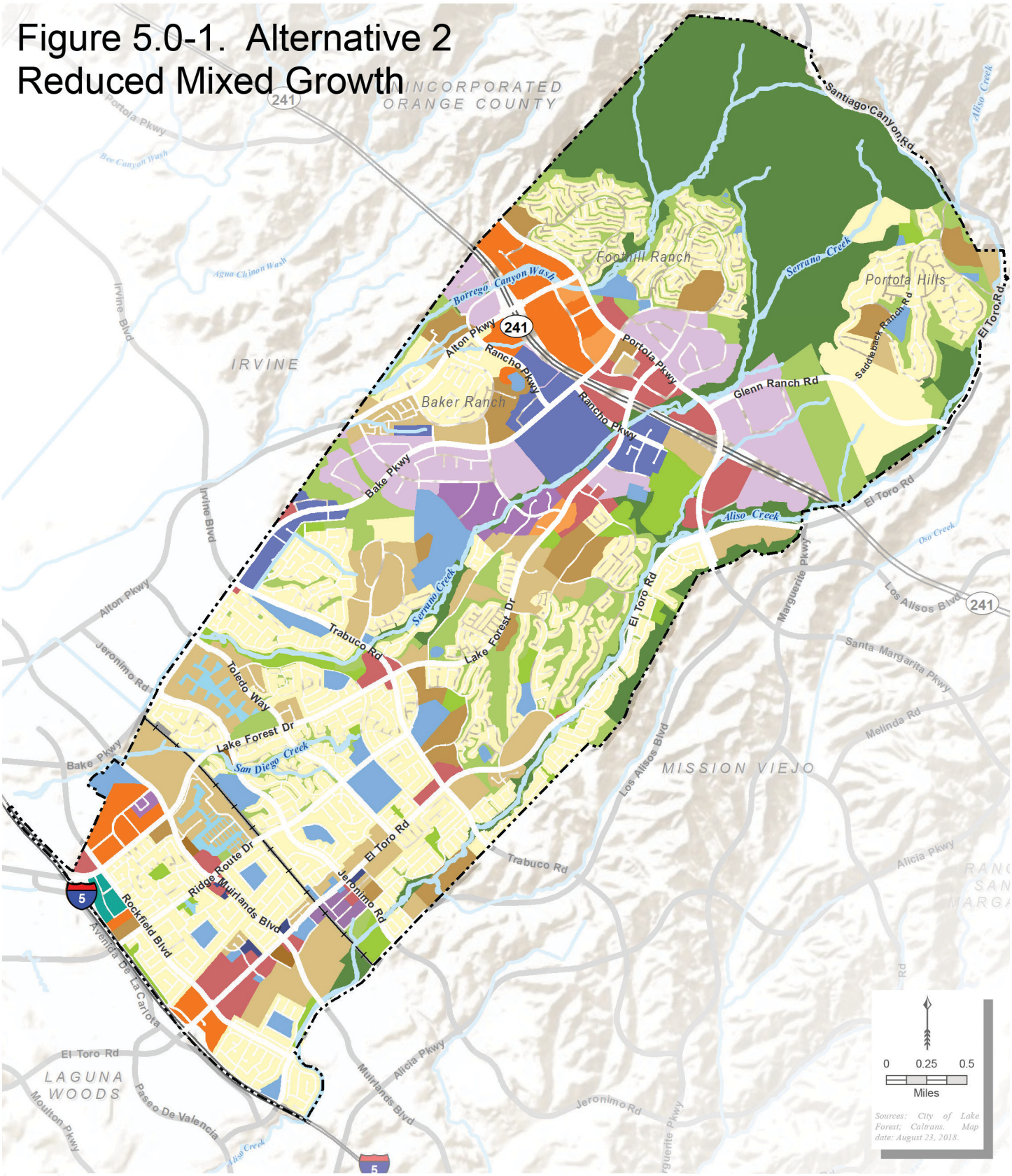
Figure 5.0-1. Alternative 2 Reduced Mixed Growth



Legend

- LOW DENSITY RESIDENTIAL
- LOW-MEDIUM DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- MIXED-USE 32
- MIXED-USE 43
- BUSINESS PARK
- MIXED-USE - OFFICE
- PROFESSIONAL OFFICE
- LIGHT INDUSTRIAL
- URBAN INDUSTRIAL 25
- URBAN INDUSTRIAL 43
- PUBLIC FACILITY
- COMMUNITY PARK/OPEN SPACE
- REGIONAL PARK/OPEN SPACE
- OPEN SPACE
- LAKE
- TRANSPORTATION CORRIDOR

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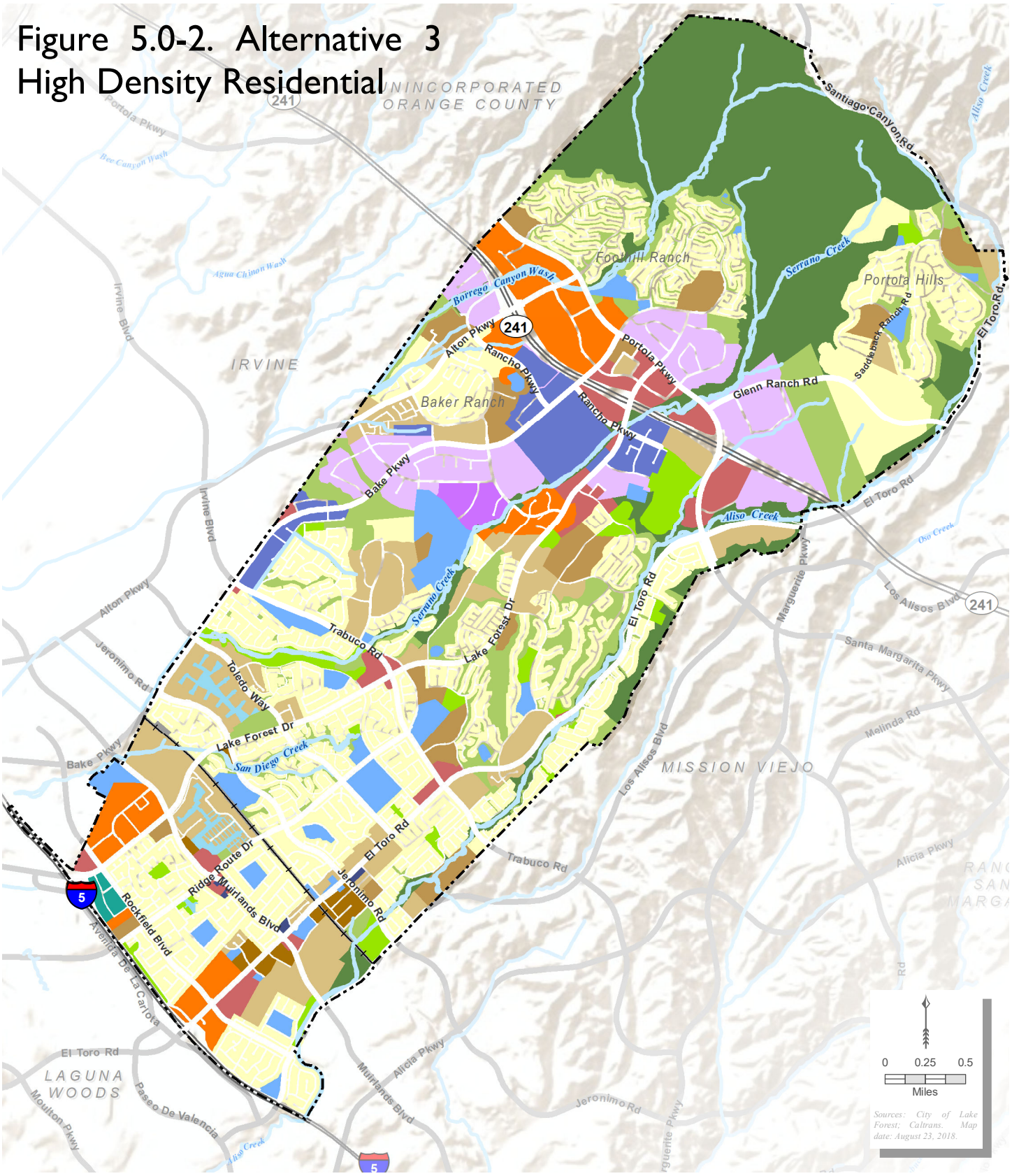
Figure 5.0-2. Alternative 3 High Density Residential



Legend

- LOW DENSITY RESIDENTIAL
- LOW-MEDIUM DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- MIXED-USE 43
- BUSINESS PARK
- MIXED-USE - OFFICE
- PROFESSIONAL OFFICE
- LIGHT INDUSTRIAL
- URBAN INDUSTRIAL 25
- PUBLIC FACILITY
- COMMUNITY PARK/OPEN SPACE
- REGIONAL PARK/OPEN SPACE
- OPEN SPACE
- LAKE
- TRANSPORTATION CORRIDOR

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Appendix A

Notice of Preparation and NOP Comments

NOTICE OF PREPARATION AND SCOPING MEETING
CITY OF LAKE FOREST

DATE:	THURSDAY SEPTEMBER 5, 2019
SUBJECT:	NOTICE OF PREPARATION (NOP) AND SCOPING MEETING FOR THE LAKE FOREST GENERAL PLAN UPDATE ENVIRONMENTAL IMPACT REPORT
TO:	STATE CLEARINGHOUSE, STATE RESPONSIBLE AGENCIES, STATE TRUSTEE AGENCIES, OTHER PUBLIC AGENCIES, INTERESTED ORGANIZATIONS, MEMBERS OF THE PUBLIC, AND THE COUNTY CLERK
LEAD AGENCY:	CITY OF LAKE FOREST, DEVELOPMENT SERVICES DEPARTMENT
PROJECT TITLE:	CITY OF LAKE FOREST GENERAL PLAN UPDATE

NOTICE IS HEREBY GIVEN that the City of Lake Forest will prepare an Environmental Impact Report (EIR) for the City of Lake Forest General Plan Update. The City is the lead agency for the project. The purpose of this notice is (1) to serve as a Notice of Preparation (NOP) of an EIR pursuant to the State CEQA Guidelines § 15082, (2) to advise and solicit comments and suggestions regarding the scope and content of the EIR to be prepared for the proposed project, and (3) to notice the public scoping meeting.

The City determined that the proposed project would require preparation of a full-scope EIR; thus, an Initial Study was not prepared in conjunction with this Notice of Preparation (NOP). Consistent with § 15168 of the State CEQA Guidelines, the City will prepare an EIR to address the environmental impacts associated with the project at a programmatic level. The proposed project is a long-term plan consisting of policies that will guide future development activities and City actions. No specific development projects are proposed as part of this General Plan Update. However, the program EIR can serve to streamline environmental review of future projects.

Notice of Preparation 30-Day Comment Period: The City of Lake Forest, as Lead Agency, requests that responsible and trustee agencies, and the Office of Planning and Research, respond in a manner consistent with § 15082(b) of the CEQA Guidelines. Pursuant to Public Resources Code § 21080.4, responsible agencies, trustee agencies and the Office of Planning and Research must submit any comments in response to this notice no later than 30 days after receipt. In accordance with the time limits established by CEQA, the NOP public review period will begin on September 5, 2019 and end on October 4, 2019.

In the event that the City does not receive a response or request for additional review time from any Responsible or Trustee Agency by the end of the review period, the Lead Agency may presume that the Responsible Agency or Trustee Agency has no response to make (State CEQA Guidelines Section 15082(b)(2)).

Comments in response to this notice must be submitted in writing at the address below by the close of the 30-day NOP review period, which is 6:00 PM on October 4, 2019:

Gayle Ackerman, AICP, Director of Community Development
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Scoping Meeting: The City will hold a scoping meeting in conjunction with this NOP in order to present the project and the EIR process and to provide an opportunity for agency representatives and the public to assist the lead agency in determining the scope and content of the environmental analysis for the EIR. The date, time and place of the meeting is as follows:

Tuesday September 24, 2019
6:00 p.m. to 7:00 p.m.
Lake Forest City Hall
25550 Commercentre Drive
Lake Forest, CA 92630

Project-Related Documents: Extensive outreach has been conducted with the Lake Forest community as part of the General Plan Update process, including coordination with the City's General Plan Advisory Committee (GPAC). Additionally, the Lake Forest City Council has received six quarterly public briefings regarding the General Plan Update. Lake Forest's existing General Plan documents and materials for the General Plan Update and Program EIR, including the Existing Conditions Report, Issues and Challenges Report, Land Use Themes Report, Vision and Values Summary Report, Community Vision Statement, GPAC meeting materials, and City Council Briefing presentations are available at: https://lakeforest.generalplan.org/.

Signature: *Gayle Ackerman*

Name: Gayle Ackerman, AICP, Director of Community Development

PROJECT LOCATION

As shown on Figure 1, the City of Lake Forest is located in the heart of South Orange County and the Saddleback Valley, approximately 47 miles southeast of Los Angeles. Lake Forest was incorporated as a city in 1991 to help ensure that it will always be an ideal place for business to prosper and people to live, work and play. Since being incorporated, Lake Forest has expanded its limits to include the communities of Foothill Ranch and Portola Hills. These newer communities are master planned developments that brought homes and commercial centers to the Eastern boundary of Lake Forest throughout the 1990s. The total land area of Lake Forest is approximately 16 square miles.

Lake Forest is bordered by the Santa Ana Mountains/County of Orange to the northeast, the City of Mission Viejo to the east, the City of Laguna Hills to the south, and the City of Irvine to the west. The city is accessed by Interstate 5 (I-5) and the Foothill Transportation Corridor/State Route 241 (SR-241).

PROJECT DESCRIPTION

The City of Lake Forest is in the process of preparing a comprehensive update to its existing General Plan. The update is expected to be completed in 2020 and will guide the City's development and conservation for the next 20 years to 2040. As shown on Figure 2, the City limits and its Sphere of Influence (SOI) are contiguous, and together comprise what is referred to as the "Planning Area" for the General Plan.

State law requires that a general plan contain eight elements: land use, circulation, housing, open space, noise, safety, environmental justice, and conservation. The contents of these elements are outlined in

state law. At the discretion of each jurisdiction, the general plan may combine these elements and may add optional elements relevant to the physical features of the jurisdiction. The Lake Forest General Plan will include all of the State-mandated elements, as well as optional elements, including Community Design (combined with the Land Use Element), Public Facilities, Economic Development, and Community Health and Wellness.

The following objectives are identified for the General Plan Update:

1. Reflect the current goals and vision expressed by city residents, businesses, decision-makers, and other stakeholders;
2. Address issues and concerns identified by city residents, businesses, decision-makers, and other stakeholders;
3. Protect Lake Forest's family-oriented environment, character, and sense of community;
4. Provide a range of high-quality housing options;
5. Attract and retain businesses and industries that provide high-quality and high-paying jobs so that residents can live and work in Lake Forest;
6. Expand retail shopping opportunities to provide better local services and increased sales tax revenues;
7. Continue to maintain the road network and improve multimodal transportation opportunities;
8. Maintain strong fiscal sustainability and continue to provide efficient and adequate public services; and
9. Address new requirements of State law.

GENERAL PLAN BUILDOUT SUMMARY

The EIR will evaluate the anticipated development that could occur within the Planning Area if every parcel developed at the densities and intensities expected under the General Plan. While no specific development projects are proposed as part of the General Plan Update, the General Plan will accommodate future growth in Lake Forest, including new businesses, expansion of existing businesses, and new residential uses; the land uses proposed for the Planning Area are illustrated on Figure 3, Benchmark Land Use Plan.

The buildout analysis utilizes a 20-year horizon, and 2040 is assumed to be the buildout year of the General Plan. Table 1 provides a statistical summary of the buildout potential associated with the Benchmark Land Use Plan compared to existing on-the-ground conditions and the currently adopted General Plan.

Table 1 Buildout Statistical Summary

	Housing Units	Population	Nonresidential Square Footage	Jobs	Jobs per Housing Unit
Existing Conditions (8/1/19)	28,928	81,888	15,315,700	38,039	1.31
Current General Plan	36,700	108,998	26,077,229	48,209	1.31
Benchmark Land Use Map	51,334	152,462	27,726,585	52,241	1.02
New Growth Potential Over Existing Conditions	22,406	70,574	12,410,885	14,202	-
New Growth Potential Over Current General Plan	14,634	43,464	1,649,356	4,032	-

PUBLIC AGENCY APPROVALS

The City Council is the final decision-making body for the General Plan Update. Before the City Council considers the proposed project, the Planning Commission will review it and make recommendations to City Council. While other agencies may be consulted during the General Plan Update process, their

approval is not required for adoption of the General Plan Update. However, subsequent development under the General Plan Update may require approval of state, federal and responsible trustee agencies that may rely on the programmatic EIR for decisions in their areas of expertise.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

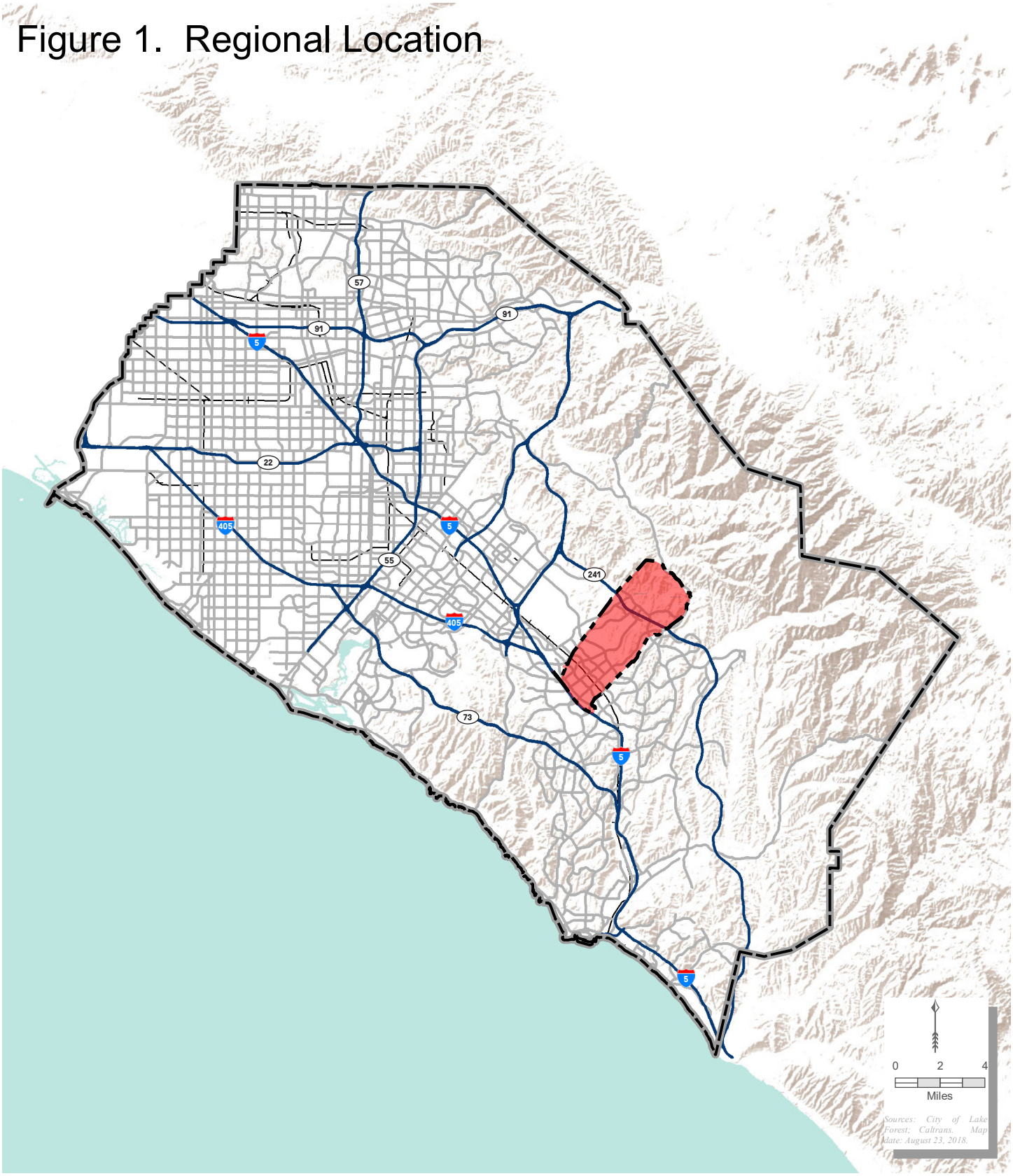
The proposed project could potentially affect the following environmental factors, and each will be addressed in the EIR:

» Aesthetics
» Air Quality
» Agricultural & Forest Resources
» Biological Resources
» Cultural Resources
» Energy
» Geology/Soils
» Greenhouse Gas Emissions
» Hazards and Hazardous Materials
» Hydrology/Water Quality
» Land Use and Planning
» Mineral Resources
» Noise
» Population and Housing
» Public Services
» Parks and Recreation
» Transportation and Traffic
» Tribal Cultural Resources
» Utilities and Service Systems
» Wildfires
» Mandatory Findings of Significance

ATTACHMENTS

» Figure 1: Regional Location
» Figure 2: Aerial Photograph
» Figure 3: Benchmark Land Use Plan (Planning Area)

Figure 1. Regional Location



Legend

Orange County

City of Lake Forest

Our Vision. Our Plan.

Lake Forest 2040

De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

Figure 2. Aerial Photograph

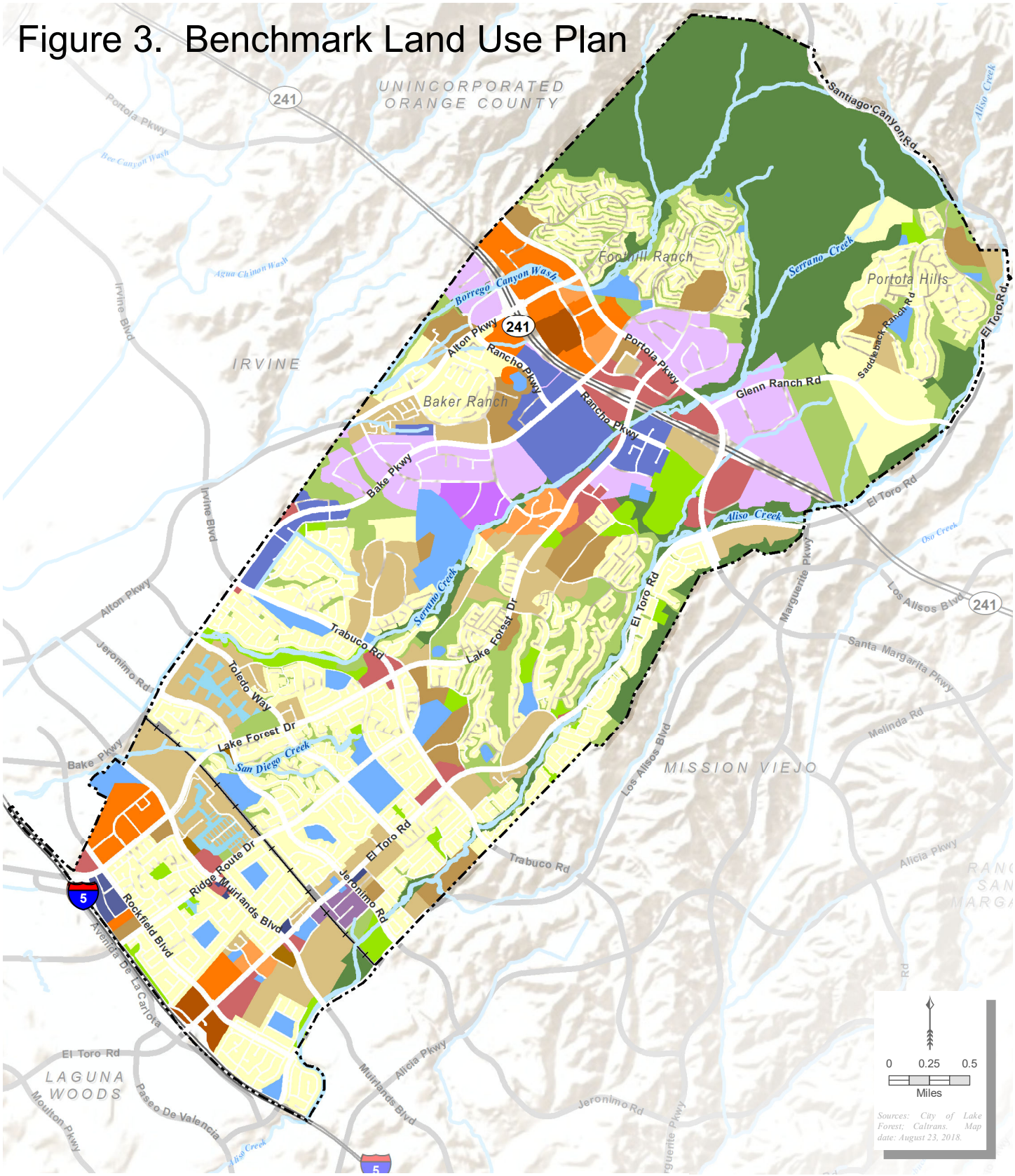
Legend

City of Lake Forest

Lake Forest 2040
Our Vision. Our Plan.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

Figure 3. Benchmark Land Use Plan



Legend

- LOW DENSITY RESIDENTIAL
- LOW-MEDIUM DENSITY RESIDENTIAL
- MEDIUM DENSITY RESIDENTIAL
- HIGH DENSITY RESIDENTIAL
- COMMERCIAL
- MIXED-USE 32
- MIXED-USE 43
- MIXED-USE 60
- BUSINESS PARK
- MIXED-USE - OFFICE
- PROFESSIONAL OFFICE
- LIGHT INDUSTRIAL
- URBAN INDUSTRIAL 25
- URBAN INDUSTRIAL 43
- PUBLIC FACILITY
- COMMUNITY PARK/OPEN SPACE
- REGIONAL PARK/OPEN SPACE
- OPEN SPACE
- LAKE
- TRANSPORTATION CORRIDOR

Our Vision. Our Plan. Lake Forest 2040

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

DEPARTMENT OF TRANSPORTATION
DISTRICT 12
1750 EAST FOURTH STREET, SUITE 100
SANTA ANA, CA 92705
PHONE (657) 328-6267
FAX (657) 328-6510
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

October 3, 2019

Gayle Ackerman
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

File: IGR/CEQA
SCH#: 2019090102
12-ORA-2019-01223
SR 241
I-5

Dear Ms. Ackerman,

Thank you for including the California Department of Transportation (Caltrans) in the review of the Notice of Preparation for the General Plan Update for the City of Lake Forest. The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability.

The General Plan update is expected to be completed in 2020 and will guide the City's development and conservation for the next 20 years to 2040. The City of Lake Forest is in proximity to the State Highway System (SHS). Caltrans is a responsible/commenting agency on this project and upon review, we have the following comments:

Office of Planning and Research 2017 General Plan Guidelines

1. As of 2017, the Governor's Office of Planning and Research (OPR) updated its General Plan Guidelines (GPG) as statutorily required by Government Code Section 65040.2. The GPG is used as a resource to assist communities and accomplish its community goals and priorities while meeting the goals and practices of the State. The updated GPG includes a free General Plan Mapping Tool which incorporates requirements for the mandatory elements and provides Geographic Information Systems tools necessary for cities and counties to use when drafting a General Plan. Social inequities are intimately tied to the environment. Therefore, the updated GPG also expands the equity and environmental justice section including new sections on healthy communities, equitable and resilient communities, economic development, and climate change. For information on the major changes, please refer to OPR website for more information: http://www.opr.ca.gov/planning/general-plan/

Traffic Impact Study

2. In the next environmental document, please include a Traffic Impact Study (TIS) that analyzes short-term and long-term impacts to the SHS including on-ramps, off-ramps, and freeway mainline specifically for State Route 241 and Interstate 5.

Please include the following:

- Existing and Build-out Annual Average Daily traffic volumes.
- Existing and Build-out AM and PM Peak Hour traffic volumes.
- A discussion of trip generation methodology including any counts, traffic modeling and forecasting tools, distribution and assignments, justification of modal splits, etc.
- A discussion of any Transportation Demand Management measures including potential funding to support longevity of these measures.
- Traffic impact analysis methodology used and any specific assumptions used that are unique to the City of Lake Forest.
- Ninety-five percent queue information for all off-ramps on the SHS under the Build-out condition.
- Potentially significant adverse impacts and its associated mitigation measures. Any impacts to the SHS should not be deemed 'Significant and Unavoidable' without consultation with Caltrans to mitigate these impacts in the early development stages of the environmental document.

Multimodal Planning

3. Moving toward the State's SB 743 goals includes supporting infill land use, reducing greenhouse gas emissions, and supporting active transportation. Caltrans suggests that the General Plan Update includes a Vehicle Miles Travels (VMT) based transportation analysis that assesses impacts and mitigates with transportation demand management (TDM), multimodal, and operational efficiency projects.

4. In addition, the General Plan Update should also include an analysis of existing multimodal transportation system. Under the Complete Streets Act of 2008, Assembly Bill (AB) 1358, cities and counties are required to integrate multimodal transportation network policies into the circulation elements of its General Plans. These networks should allow for all citizens to effectively travel by motor vehicle, foot, bicycle, and transit to reach

destinations throughout the city. Prioritizing and allocating space to efficient modes of travel can allow streets to transport more people in a fixed amount of right-of-way. The goal is to encourage connectivity within the local and regional bicycle network. Poor connectivity can result in higher speed of traffic along local roads and a more hostile environment for pedestrians.

Freight

Please consider including the following in the General Plan where it would be deemed appropriate:

5. Please consider overnight parking and well-lit parking lots to accommodate truckers rather than empty lots or side streets. Ensure adequate truck parking is onsite for trucks or that there are nearby areas for trucks to stage and park while they are waiting for pick-ups/drop offs.

6. In order to reduce conflicts with traffic and bicycles, please consider directing deliveries to loading docks away from curbside. Please also consider redesigning outdated loading docks to accommodate new freight truck design. Utilize alley space, if available, to take trucks off street curbs

7. For all freight designated on-street parking, ensure that the width of the parking lane is wide enough for freight trucks, so parked trucks do not take up space in bicycle lane or street lane. Designate on-street freight-only parking and delivery time windows and appropriate signage if building loading docks are not accessible or non-existent and ensure that this parking is close to business entryway to reduce distance needed to travel from the truck to business.

8. Please consider designing freight parking spaces to accommodate loading ramp and ensure that the maximum length of ramp (typically 40') will not interfere with vehicle parking, pedestrian paths, or bicycle lanes/bicycle parking.

9. We recommend commercial and residential developments to offer pick-up point services or automated parcel systems to allow for deliveries that can be made with one truck stop instead of multiple stops to individual residences.

10. Bicycle parking especially designed for cargo bikes, especially food delivery services, should be installed to encourage and facilitate the growing use of food delivery services and parcel deliveries.

11. Establish freight pick up and drop off times that do not coincide with peak commute hours.

Climate Change Reductions

12. Further, AB 32, also known as the California Global Warming Solutions Act of 2006 mandates Greenhouse Gas (GHG) emissions reduction in California. Senate Bill (SB) 375, also known as the Sustainable Communities and Climate Protection Act of 2008, capitalizes on the need for reducing GHG by directing the California Air Resources Board to set regional targets for reducing GHG emissions. SB 375 builds on AB 32 in coordinated efforts to address transportation and land use planning needs with an overall goal of promoting more sustainable communities. SB 375 sets emission reduction standards for the years 2020 and 2035. Consistent with the goals brought forth by AB 32, SB 375 encourages plans/projects consistent with to-be regional plan that achieves GHG reductions as those highlighted in the Southern California Association of Governments' (SCAG) 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). As noted by the updated GPG, it is important to address these environmental impacts.

13. It is our recommendation for the city of Lake Forest to incorporate these recommended practices and policies within the Lake Forest General Plan Update. By addressing impacts at the General Plan level, Caltrans and the City can ensure that those impacts are mitigated or avoided, while also providing streamlining benefits at the project level.

Americans with Disabilities Act

14. The Americans with Disabilities Act of 1990 (ADA) provides comprehensive rights and protections to individuals with disabilities. Please consult available accessibility Guidelines for public rights-of-way to implement the goal of ADA compliance.

Encroachment Permits

15. Please be advised that any project work proposed in the vicinity of the State Highway System (SHS) will require an Encroachment Permit and all environmental concerns must be adequately addressed. If the

environmental documentation for the project does not meet Caltrans' requirements, additional documentation would be required before the approval of the Encroachment Permit. For specific details for Encroachment Permits procedure, please refer to the Caltrans' Encroachment Permits Manual. The latest edition of the Manual is available on the web site: http://www.dot.ca.gov/hq/traffops/developserv/permits/

Please continue to keep us informed of this project and any future developments which could potentially impact the SHS. If you have any questions, please do not hesitate to contact Joseph Jamoralin, at (657) 328-6276 or Joseph.Jamoralin@dot.ca.gov.

Sincerely,

SCOTT SHELLEY
Branch Chief, Regional-IGR-Transit Planning
District 12

October 2, 2019

VIA E-MAIL AND U.S. MAIL

Gail Ackerman, Director of Development Services
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630
E-mail: gackerman@lakeforestca.gov

Re: Request for Notice of City of Lake Forest Projects Subject to CEQA Near SR 73, Lake Forest Drive, and/or El Toro Road

Dear Ms. Ackerman,

The City of Laguna Beach hereby requests timely written notice of all proposed projects within the City of Lake Forest, near SR 73, Lake Forest Drive, and/or El Toro Road, for which an Environmental Impact Report (EIR), Negative Declaration, or Mitigated Negative Declaration will be prepared. This request for notice also applies to the currently pending Lake Forest General Plan Update environmental review and adoption process for which a Notice of Preparation of a Draft EIR was recently released.

As an agency with jurisdiction over major local arterials that may be significantly impacted by development activities, Laguna Beach seeks inter-agency consultation with Lake Forest concerning each of the above-referenced proposed projects, pursuant to the CEQA statute and consistent with Lake Forest's Local Guidelines for Implementing CEQA.[1] More specifically, this request for notice and timely consultation is made pursuant to Public Resources Code, sections 21083.9, 21092.2, and 21092.4. Even though annual renewal of requests for notice is ordinarily required under Lake Forest's Local Guidelines for Implementing CEQA, because inter-agency consultation is required, please consider this request perpetual. Please confirm that annual renewal of this request is not necessary under the circumstances.

Pursuant to Public Resources Code, section 21092.2(a), such notice may be provided via e-mail, addressed to both me and Greg Pfost, Director of Community Development. Our respective e-mail addresses are: cjohnson@lagunabeachcity.net and gpfost@lagunabeachcity.net. In addition, please send a hard copy of such notice to:

City Manager's Office
City of Laguna Beach
505 Forest Avenue
Laguna Beach, CA 92651

[1] *See* Local Guidelines for Implementing CEQA, pp. 7-3, 7-8 – 7-10.

Please let me know if you have any questions or concerns regarding this request for notice and consultation. Thank you in advance for your cooperation.

Sincerely,

Christa Johnson
Assistant City Manager

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov

RECEIVED
SEP 16 2019
CITY OF LAKE FOREST
COMMUNITY DEVELOPMENT

September 10, 2019

Gayle Ackerman
Lake Forest, City of
25550 Commercentre Drive Suite 100
Lake Forest, CA 92630

RE: SCH# 2019090102, City of Lake Forest General Plan Update Project, Orange County

Dear Ms. Ackerman:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP) for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
    a. A brief description of the project.
    b. The lead agency contact information.
    c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
    d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
    a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
    a. Alternatives to the project.
    b. Recommended mitigation measures.
    c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
    a. Type of environmental review necessary.
    b. Significance of the tribal cultural resources.
    c. Significance of the project's impacts on tribal cultural resources.
    d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
    a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
    b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Staff Services Analyst

cc: State Clearinghouse

OCTA

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October 4, 2019

Ms. Gayle Ackerman
Director of Community Development
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Subject: **City of Lake Forest General Plan Update Notice of Preparation**

Dear Ms. Ackerman:

Thank you for providing the Orange County Transportation Authority (OCTA) with the Notice of Preparation for the City of Lake Forest General Plan Update (Project). The following comments regarding the Master Plan of Arterial Highways (MPAH) are provided for your consideration:

- On May 8, 2017, the OCTA Board of Directors (Board) conditionally approved a MPAH amendment to reclassify Santiago Canyon Road from the State Route 241 northbound off-ramps to Live Oak Canyon Road from a Primary Arterial (four-lane, divided) to a collector (two-lane, undivided). The Board's approval remains conditional until OCTA has received documentation that the City of Lake Forest and the County of Orange have amended their general plans and complied with the requirements of the California Environmental Quality Act.

- On July 23, 2012, the OCTA Board approved a MPAH amendment to:
  - remove Bake Parkway between Lake Forest Drive and SR-133,
  - remove Ridge Route from Santa Vittoria Drive to Bake Parkway,
  - remove Santa Maria Avenue from Santa Vittoria Drive to SR-133, and
  - add Santa Vittoria Drive from Lake Forest Drive to Santa Maria as a collector.

  The MPAH Cooperative Study and traffic analysis determined that the following intersections could be impacted as a result of the MPAH amendment request:
  - Bake Parkway/Research Drive (City of Irvine),
  - Paseo de Valencia/Avenida de la Carlota (City of Laguna Hills),
  - El Toro Road/Avenida de la Carlota (City of Laguna Hills), and
  - Ridge Route Drive/Rockfield Boulevard (City of Lake Forest).

Please note that a Memorandum of Understanding (MOU) was developed amongst the agencies to ensure that mitigations for these intersections, if needed in the future, would be implemented. Please see the attached MOU for the City of Lake Forest's responsibilities for Ridge Route Drive/Rockfield Boulevard.

- Please note that consistency with the MPAH is a prerequisite for local agencies to be eligible for Measure M2 Net Revenues as well as programs – including the Orange County Comprehensive Transportation Funding Program. For any potential changes to the Circulation Element in relation to arterials on the MPAH please take the following steps:
  - initiate an MPAH amendment request with OCTA,
  - coordinate with impacted agencies, and
  - conduct a traffic analysis using an OCTA certified model.

  More information and the MPAH guidelines may be accessed online: http://www.octa.net/News-and-Resources/Open-Data/MPAH-Overview/.

Throughout the development of this project, we encourage communication with OCTA on any matters discussed herein. If you have any questions or comments, please contact me at (714) 560-5907 or at dphu@octa.net.

Sincerely,

Dan Phu
Manager, Environmental Programs

Attachment

Distributed: 1/24/13
Accounting
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FPA
PM J. Alcock, K. Allen
Vendor ✓
CA T. Krinke

MEMORANDUM OF UNDERSTANDING NO. C-2-1592

BETWEEN

ORANGE COUNTY TRANSPORTATION AUTHORITY

AND

CITIES OF IRVINE, LAGUNA HILLS, LAGUNA WOODS, LAKE FOREST,

AND COUNTY OF ORANGE

FOR

AMENDMENT OF THE MASTER PLAN OF ARTERIAL HIGHWAYS

THIS MEMORANDUM OF UNDERSTANDING (hereinafter referred to as "MOU") is effective this 21st day of January, 2013, by and between the Orange County Transportation Authority, 550 South Main Street, P.O. Box 14184, Orange, California 92863-1584 (hereinafter referred to as "AUTHORITY"), and the City of Irvine, the City of Laguna Hills, the City of Laguna Woods, the City of Lake Forest, and the County of Orange (hereinafter collectively referred to as "AGENCIES" and individually as "AGENCY"). AUTHORITY and each AGENCY are sometimes referred to collectively in this MOU as the "PARTIES" and individually as "PARTY."

RECITALS

WHEREAS, AUTHORITY administers the Master Plan of Arterial Highways (hereinafter referred to as "MPAH") including the review and approval of amendments requested by local agencies; and

WHEREAS, the City of Irvine has requested an Amendment to the MPAH to delete Bake Parkway from Lake Forest Drive to State Route 133; to delete Ridge Route Drive from Santa Vittoria Drive to Bake Parkway; to delete Santa Maria Avenue from Santa Vittoria Drive to State Route 133; and to add Santa Vittoria Drive from Lake Forest Drive to Santa Maria Avenue as a collector (two-lane, undivided) arterial (hereinafter referred to as the "Amendment to the MPAH"); and

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WHEREAS, the City of Irvine in association with the City of Laguna Hills, the City of Laguna Woods, the City of Lake Forest, the County of Orange, and AUTHORITY initiated the MPAH Cooperative Study Process; and

WHEREAS, traffic analyses conducted as part of the MPAH Cooperative Study Process determined that the Amendment to the MPAH would result in projected changes to future traffic patterns; and

WHEREAS, these projected changes in future traffic patterns resulted in a determination that appreciable impacts would occur at the intersections of Bake Parkway/Research Drive (City of Irvine), Paseo de Valencia/Avenida de la Carlota (City of Laguna Hills), El Toro Road/Avenida de la Carlota (City of Laguna Hills), and Ridge Route Drive/Rockfield Boulevard (City of Lake Forest); and

WHEREAS, an appreciable impact is defined in the AUTHORITY's Guidance for Administration of the Orange County MPAH, as an increase in Intersection Capacity Utilization ("ICU") of 0.01 for intersections exceeding Level of Service "D" or the General Plan standard adopted by the respective jurisdiction; and

WHEREAS, Exhibit A titled "SUMMARY OF MPAH AMENDMENT APPRECIABLE IMPACTS and TRAFFIC SHARE", provides a summary of the appreciable impacts occurring as a result of the Amendment to the MPAH; and

WHEREAS, improvements have been identified to mitigate appreciable impacts and maintain the operational integrity of the MPAH system; and

WHEREAS, AUTHORITY's Board of Directors approved this Amendment to the MPAH on July 23, 2012, contingent upon full execution of this MOU, as well as amendments to appropriate AGENCIES' general plans including California Environmental Quality Act requirements; and

WHEREAS, all PARTIES wish to enter into an MOU to identify the roles, responsibilities and commitments of the PARTIES in processing the Amendment to the MPAH and mitigating the related appreciable impacts; and

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NOW, THEREFORE, it is mutually understood and agreed by the PARTIES as follows:

ARTICLE 1. COMPLETE AGREEMENT:

A. This MOU, including all exhibits and documents incorporated herein and made applicable by reference, constitutes the complete and exclusive statement of the term(s) and condition(s) of the MOU between the PARTIES concerning the Amendment to the MPAH and supersedes all prior representations, understandings and communications between the PARTIES. The invalidity, in whole or part, of any term or condition of this MOU shall not affect the validity of other term(s) or conditions(s) of this MOU. The above referenced Recitals are true and correct and are incorporated by reference herein.

B. AUTHORITY'S failure to insist on any instance(s) of any AGENCY'S performance of any term(s) or condition(s) of this MOU shall not be construed as a waiver or relinquishment of AUTHORITY's right to such performance or to future performance of such term(s) or condition(s), and AGENCY'S obligation in respect thereto shall continue in full force and effect.

C. Any AGENCY'S failure to insist on any instance(s) of AUTHORITY's performance of any term(s) or condition(s) of this MOU shall not be construed as a waiver or relinquishment of AGENCY's right to such performance or to future performance of such term(s) or condition(s), and AUTHORITY's obligation in respect thereto shall continue in full force and effect.

ARTICLE 2. RESPONSIBILITIES OF AUTHORITY:

AUTHORITY agrees to the following responsibilities:

A. AUTHORITY shall administer the MPAH, including updating the MPAH to reflect the Amendment to the MPAH, upon fulfillment of all of the following conditions:

1. AUTHORITY's Board of Directors conditional approval of the Amendment to the MPAH. The AUTHORITY's Board of Director approval of the Amendment to the MPAH will not become final until conditions 2 and 3 below have been satisfied; and

2. Receipt of an original, fully executed MOU (signed by all PARTIES); and

3. Receipt of documentation that that the Cities of Irvine, Laguna Hills,

Laguna Woods, and County of Orange have amended their general plans to reflect the Amendment to the MPAH.

B. AUTHORITY shall file a Notice of Exemption from the provisions of the California Environmental Quality Act in support of the amendment to the MPAH.

ARTICLE 3. RESPONSIBILITIES OF CITY OF IRVINE:

The CITY of Irvine agrees to the following responsibilities:

A. The CITY of Irvine acknowledges that the AUTHORITY has determined the amendment to the MPAH to be exempt from the California Environmental Quality Act, and that the AUTHORITY has caused a Notice of Exemption to be filed, posted, and recorded.

B. The CITY of Irvine shall implement one of the two mitigation measures identified below.

1. Bake Parkway/Research Drive: conversion of a westbound through lane on Research Drive to shared through/second right-turn lane; or

2. Bake Parkway/Research Drive: addition of a second westbound right-turn lane on Research Drive.

C. This mitigation measure is to be implemented before the ICU at this intersection reaches the pre-Amendment to the MPAH ICU of 0.94. These improvements are not meant to be prescriptive. If the CITY of Irvine is able to identify alternative improvements which meet the overall objective of achieving and/or maintaining the pre-Amendment to the MPAH ICU, then those improvements shall be considered acceptable alternatives and shall be implemented as substitute solutions.

D. The CITY of Irvine shall amend the Circulation Element of its General Plan to reflect the Amendment to the MPAH, and in doing so, shall comply with the requirements of the California Environmental Quality Act.

E. The CITY of Irvine enters into this MOU in order for the above mitigation measure to be implemented.

F. The Share Cost Allocation for this mitigation, as identified in Exhibit B titled "IMPACTED INTERSECTIONS SHARE COST ALLOCATION," will be funded through the County of Orange's

Coastal Area Roadway Improvements and Traffic Signal Program (hereinafter referred to as the "CARITS Program").

ARTICLE 4. RESPONSIBILITIES OF CITY OF LAGUNA HILLS:

The CITY of Laguna Hills agrees to the following responsibilities:

A. The CITY of Laguna Hills acknowledges that the AUTHORITY has determined the amendment to the MPAH to be exempt from the California Environmental Quality Act, and that the AUTHORITY has caused a Notice of Exemption to be filed, posted, and recorded.

B. The CITY of Laguna Hills shall implement the mitigation measures identified below.

1. Paseo de Valencia/Avenida de la Carlota: restripe the southbound approach on Paseo de Valencia to provide 2.5 left-turn lanes, 1.5 through lanes and no right-turn lane, and construct a third eastbound receiving lane on Avenida de la Carlota for the third southbound left-turn lane; and

2. El Toro Road/Avenida de la Carlota: restripe the westbound approach on Avenida de la Carlota to provide a shared left-turn/through lane and two right-turn lanes, retaining the existing westbound right-turn overlap with the southbound left-turn movement.

C. These mitigation measures are to be implemented before the ICU at these intersections reaches the pre-Amendment to the MPAH ICU of 1.01 for the Paseo de Valencia/Avenida de la Carlota intersection and 1.02 for the El Toro Road/Avenida de la Carlota intersection, respectively. These improvements are not meant to be prescriptive. If the CITY of Laguna Hills is able to identify alternative improvements, which meet the overall objective of achieving and/or maintaining the pre-Amendment to the MPAH ICU, then those improvements shall be considered acceptable alternatives and shall be implemented as substitute solutions.

D. The CITY of Laguna Hills shall amend the Circulation Element of its General Plan to reflect the Amendment to the MPAH, and comply with the requirements from the California Environmental Quality Act.

E. The CITY of Laguna Hills enters into this MOU in order for the above mitigation

measures to be implemented.

F. The Share Cost Allocation for this mitigation is identified in Exhibit B, and will be funded through the CARITS Program.

ARTICLE 5. RESPONSIBILITIES OF CITY OF LAGUNA WOODS:

The CITY of Laguna Woods agrees to the following responsibilities:

A. The CITY of Laguna Woods acknowledges that the AUTHORITY has determined the amendment to the MPAH to be exempt from the California Environmental Quality ACT, and that the AUTHORITY has caused a Notice of Exemption to be filed, posted, and recorded.

B. The CITY of Laguna Woods shall amend the Circulation Element of its General Plan to reflect the Amendment to the MPAH, and comply with the requirements from the California Environmental Quality Act.

ARTICLE 6. RESPONSIBILITIES OF CITY OF LAKE FOREST:

The CITY of Lake Forest agrees to the following responsibilities:

A. The CITY of Lake Forest acknowledges that the AUTHORITY has determined the amendment to the MPAH to be exempt from the California Environmental Quality Act, and that the AUTHORITY has caused a Notice of Exemption to be filed, posted, and recorded.

B. The CITY of Lake Forest shall implement the following mitigation measure identified below.

1. Ridge Route Drive/Rockfield Boulevard: narrowing of the existing raised median on Ridge Route Drive to four feet in both the northbound and southbound directions to create left turn pockets, and also provide defacto right turn lanes in both directions.

C. This mitigation measure is to be implemented before the ICU at this intersection reaches the pre-Amendment to the MPAH ICU of .98. This improvement is not meant to be prescriptive. If the CITY of Lake Forest is able to identify alternative improvements which meet the overall objective of achieving and/or maintaining the pre-Amendment to the MPAH ICU, then those improvements shall be considered acceptable alternatives and shall be implemented as substitute solutions.

D. The CITY of Lake Forest enters into this MOU in order for the above mitigation measure to be implemented.

E. The Share Cost Allocation for this mitigation is identified in Exhibit B and will be funded through available CITY of Lake Forest non-general fund and/or grant sources.

ARTICLE 7. RESPONSIBILITIES OF COUNTY OF ORANGE:

The COUNTY of Orange agrees to the following responsibilities:

A. The COUNTY of Orange acknowledges that the AUTHORITY has determined the amendment to the MPAH to be exempt from the California Environmental Quality Act, and that the AUTHORITY has caused a Notice of Exemption to be filed, posted, and recorded.

B. The COUNTY of Orange, contingent upon the finalized Amendment to the MPAH, will reprogram CARITS Program mitigation funds originally identified for the intersection of Bake Parkway/Laguna Canyon Road as part of the Aliso Creek Road MPAH amendment (now being deleted as a result of the Amendment to the MPAH).

C. These CARITS funds, when reprogrammed, will be allocated to the Share Cost Allocations for improvements at the intersections of Bake Parkway/Research Drive (City of Irvine), Paseo de Valencia/Avenida de la Carlota (City of Laguna Hills), and El Toro Road/Avenida de la Carlota (City of Laguna Hills) as identified in Exhibit B.

D. The COUNTY of Orange shall amend the Transportation Element of the County of Orange General Plan, including the Circulation Plan to reflect the Amendment to the MPAH, and comply with the requirements from the California Environmental Quality Act.

E. The COUNTY of Orange enters into this MOU in order for the above mitigation measures to be implemented.

F. Upon receipt of evidence of the finalized MPAH Amendment, the COUNTY, within 60 days, will make reprogrammed CARITS funding available to the eligible jurisdictions identified in this MOU.

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ARTICLE 8. DELEGATED AUTHORITY:

The actions required to be taken by the CITIES of Irvine, Laguna Hills, Lake Forest, and Laguna Woods in the implementation of this MOU are delegated to each CITY's City Manager, or designee. The actions required to be taken by COUNTY in the implementation of this MOU are delegated to its Chair of the Board, or designee. The actions required to be taken by AUTHORITY in the implementation of this MOU are delegated to AUTHORITY's Chief Executive Officer, or designee.

ARTICLE 9. INDEMNIFICATION:

A. Each AGENCY shall indemnify, defend and hold harmless AUTHORITY, its officers, directors, employees and agents from and against any and all claims (including attorney's fees and reasonable expenses for litigation or settlement) for any loss or damages, bodily injuries, including death, worker's compensation subrogation claims, damage to or loss of use of property, arising from the negligent acts, omissions or willful misconduct by each AGENCY, its officers, directors, employees or agents in connection with or arising out of the performance of this MOU.

B. AUTHORITY shall indemnify, defend and hold harmless each AGENCY, its officers, directors, employees and agents from and against any and all claims (including attorney's fees and reasonable expenses for litigation or settlement) for any loss or damages, bodily injuries, including death, worker's compensation subrogation claims, damage to or loss of use of property, arising from the negligent acts, omissions or willful misconduct by AUTHORITY, its officers, directors, employees or agents in connection with or arising out of the performance of this MOU.

C. AGENCIES shall indemnify, defend and hold harmless each AGENCY, its officers, directors, employees and agents from and against any and all claims (including attorney's fees and reasonable expenses for litigation or settlement) for any loss or damages, bodily injuries, including death, worker's compensation subrogation claims, damage to or loss of use of property, arising from the negligent acts, omissions or will misconduct by AGENCIES, their officers, directors, employees or agents in connection with or arising out of the performance of this MOU.

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D. Indemnification and defense obligations of this MOU shall survive its expiration or termination.

ARTICLE 10. MUTUAL RESPONSIBILITIES OF ALL AGENCIES:

A. Each PARTY to this MOU agrees to cooperate and coordinate with the other PARTIES to this MOU and their respective staff, contractors, consultants, and vendors, etc. providing services required under this MOU to the extent practicable.

B. All PARTIES to this MOU agree to work diligently together, and in good faith, toward the resolution of any unforeseen issues and disputes arising out of the performance of this MOU.

ARTICLE 11. ADDITIONAL PROVISIONS

The PARTIES agree to the following:

A. Termination: This Agreement shall continue in full force and effect through June 30, 2032. This MOU shall not be terminated without the written consent of all PARTIES.

B. This MOU may be amended in writing at any time by the consent of all PARTIES. No amendment shall have any force or effect unless executed in writing by all PARTIES.

C. AUTHORITY and AGENCIES shall comply with all applicable federal, state, and local laws, statues, ordinances and regulations in the performance of this MOU.

D. Successors in Interest: This MOU shall be binding upon and shall inure to the benefit of the parties hereto and their respective heirs, personal representatives, successors, and assigns.

E. Attorney's Fees: In the event any action is brought between the parties hereto relating to this MOU or the breach thereof, the prevailing party in such action shall be entitled to recover from the other party reasonable expenses, attorneys' fees and costs in connection with such action or proceeding.

F. Legal Authority: Each of the undersigned represents and warrants that they are authorized to execute this MOU on behalf of said PARTIES and that, by so executing this MOU, the PARTIES hereto are formally bound to the provisions of this MOU.

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G. Severability: If any term, provision, covenant or condition of this MOU is held to be invalid, void or otherwise unenforceable, to any extent, by any court of competent jurisdiction, the remainder of this MOU shall not be affected thereby, and each term, provision, covenant or condition of this MOU shall be valid and enforceable to the fullest extent permitted by law.

H. Counterparts of Agreement: This MOU may be executed and delivered in any number of counterparts, each of which, when executed and delivered shall be deemed an original and all of which together shall constitute the same agreement. Facsimile signatures will be permitted.

I. Force Majeure: Any PARTY shall be excused from performing its obligations under this MOU during the time and to the extent that it is prevented from performing by an unforeseeable cause beyond its control, including but not limited to: any incidence of fire, flood; acts of God; commandeering of material, products, plants or facilities by the federal, state or local government; national fuel shortage; or a material act or omission by any other PARTY; when satisfactory evidence of such cause is presented to the other PARTIES, and provided further that such nonperformance is unforeseeable, beyond the control and is not due to the fault or negligence of the PARTY not performing.

J. Assignment: Neither this MOU, nor any PARTY's rights, obligations, duties, or authority hereunder may be assigned in whole or in part by any PARTY without the prior written consent of all other PARTIES in their sole and absolute discretion. Any such attempted assignment shall be deemed void and of no force and effect. Consent to one assignment shall not be deemed consent to any subsequent assignment, nor the waiver of any right to consent to such subsequent assignment.

K. Obligations To Comply with Law: Nothing herein shall be deemed nor construed to authorize or require any PARTY to issue bonds, notes or other evidence of indebtedness under terms, in amounts, or for purposes other than as authorized by local, state or federal law.

L. Governing Law: The laws of the State of California and applicable local and federal laws, regulations and guidelines shall govern this MOU.

M. Notices: Any notices, requests, or demands made between the PARTIES pursuant to this MOU are to be directed as follows:

To CITY OF IRVINE:	To AUTHORITY:
City of Irvine	Orange County Transportation Authority
P.O. Box 19575 Irvine CA 92623	550 South Main Street P. O. Box 14184 Orange, CA 92863-1584
Attention: Manuel Gomez Director of Public Works Tel: (949) 724-7509 Email: mgomez@cityofirvine.org	Attention: Meena Katakia, Manager, Capital Programs Tel: (714) 560-5694 Email: mkatakia@octa.net

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To CITY OF LAGUNA HILLS:	To CITY OF LAGUNA WOODS:
City of Laguna Hills	City of Laguna Woods
24035 El Toro Road Laguna Hills, CA 92653	24264 El Toro Road Laguna Woods, CA 92637
Attention: Bruce Channing City Manager Tel: (949) 707-2610 Email:	Attention: Leslie A. Keane City Manager Tel: (949) 639-050 Email:

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To CITY OF LAKE FOREST:	To COUNTY OF ORANGE:
City of Lake Forest	County of Orange
25550 Commercecentre Drive, Suite 100 Lake Forest, CA 92630	300 N. Flower Street P.O. Box 4048 Santa Ana, CA 92702
Attention: Robert Dunek City Manager Tel: (949) 461-3400 Email:	Attention: Ignacio Ochoa Director/Chief Engineer Tel: (714) 667-3213 Email:

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N. Successors and Assigns: The provisions of this MOU shall bind and inure to the benefit of each of PARTY hereto, and all successors or assigns of any PARTY hereto.

This MOU shall continue in full force and effect until all terms and conditions of this MOU are implemented, unless terminated earlier by written consent of all the PARTIES.

The above understandings are a guide to the intent and policies of the PARTIES to this MOU. This MOU shall be effective upon execution by all PARTIES.

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IN WITNESS WHEREOF, the PARTIES hereto have caused this Memorandum of Understanding No. C-2-1592 to be executed on the date first written above.

CITY OF IRVINE

By: _____
Manuel Gomez
Director of Public Works

ORANGE COUNTY TRANSPORTATION AUTHORITY

By: _____
Will Kempton
Chief Executive Officer

ATTEST:

By: _____
Sharie Apodaca
City Clerk

APPROVED AS TO FORM:

By: _____
Phil Kohn
City Attorney

APPROVED AS TO FORM:

By: _____
Kennard R. Smart, Jr.
General Counsel

APPROVAL RECOMMENDED:

By: _____
Kia Mortazavi
Executive Director, Planning

Dated: 9/4/12

Dated: 1-9-13

Attachments:

Exhibit A: Summary of MPAH Amendment, Appreciable Impacts and Traffic Share

Exhibit B: Impacted Intersections Share Cost Allocation

Exhibit C: MPAH Amendment Map

IN WITNESS WHEREOF, the PARTIES hereto have caused this Memorandum of Understanding No. C-2-1592 to be executed on the date first written above.

CITY OF LAGUNA HILLS

By: _____
Bruce Channing
City Manager

APPROVED AS TO FORM:

By: N/A
Gregory E. Simonian
City Attorney

Dated: October 11, 2012

IN WITNESS WHEREOF, the PARTIES hereto have caused this Memorandum of Understanding No. C-2-1592 to be executed on the date first written above.

CITY OF LAGUNA WOODS

By: _____
Leslie A. Keane
City Manager

APPROVED AS TO FORM:

By: _____
David B. Cosgrove
City Attorney

Dated: 10-15-12

IN WITNESS WHEREOF, the PARTIES hereto have caused this Memorandum of Understanding No. C-2-1592 to be executed on the date first written above.

CITY OF LAKE FOREST

By: _____
Robert Dunek
City Manager

APPROVED AS TO FORM:

By: _____
Scott Smith
City Attorney

Dated: 10-17-2012

ATTEST:

By: Stephanie D. Smith
Stephanie D. Smith, CMC
City Clerk

IN WITNESS WHEREOF, the PARTIES hereto have caused this Memorandum of Understanding No. C-2-1592 to be executed on the date first written above.

COUNTY OF ORANGE
A political subdivision of the State of California

By: _____
Chair, Board of Supervisors

Date: 12-4-12

SIGNED AND CERTIFIED THAT A COPY
OF THIS DOCUMENT HAS BEEN
DELIVERED TO THE CHAIRMAN OF
THE BOARD OF SUPERVISORS

By: _____
Susan Novak
Clerk of the Board of Supervisors
Orange County, CA

Date: 12-4-12

APPROVED AS TO FORM:
COUNTY COUNSEL
ORANGE COUNTY, CALIFORNIA

By _____
Deputy

Date: 11/1/12

OCTA

EXHIBITA: SUMMARY OF MPAH AMENDMENT APPRECIABLE IMPACTS and TRAFFIC SHARE

Intersection	Jurisdiction	Peak Hour	Post-2030 Level of Service				Difference in LOS (Level of Appreciable Impact)	Share[1]
			Current MPAH		Amendment to MPAH			
			ICU	LOS	ICU	LOS		
Bake Parkway/Research Drive	Irvine	PM	0.94	E	0.96	E	0.02	5%
Paseo de Valencia/Avenida de la Carlota	Laguna Hills	PM	1.01	E	1.04	F	0.03	15%
El Toro Road/Avenida de la Carlota	Laguna Hills	PM	1.02	F	1.03	F	0.01	15%
Ridge Route/Rockfield Boulevard	Lake Forest	PM	.98	F	1.01	F	0.03	7%

[1] Shares are based on the percentage of trips from the deleted Amendment to the MPAH roads, which are assigned onto the circulation system without these roads, to the total growth in traffic at the intersection from existing to Post-2030.

OCTA

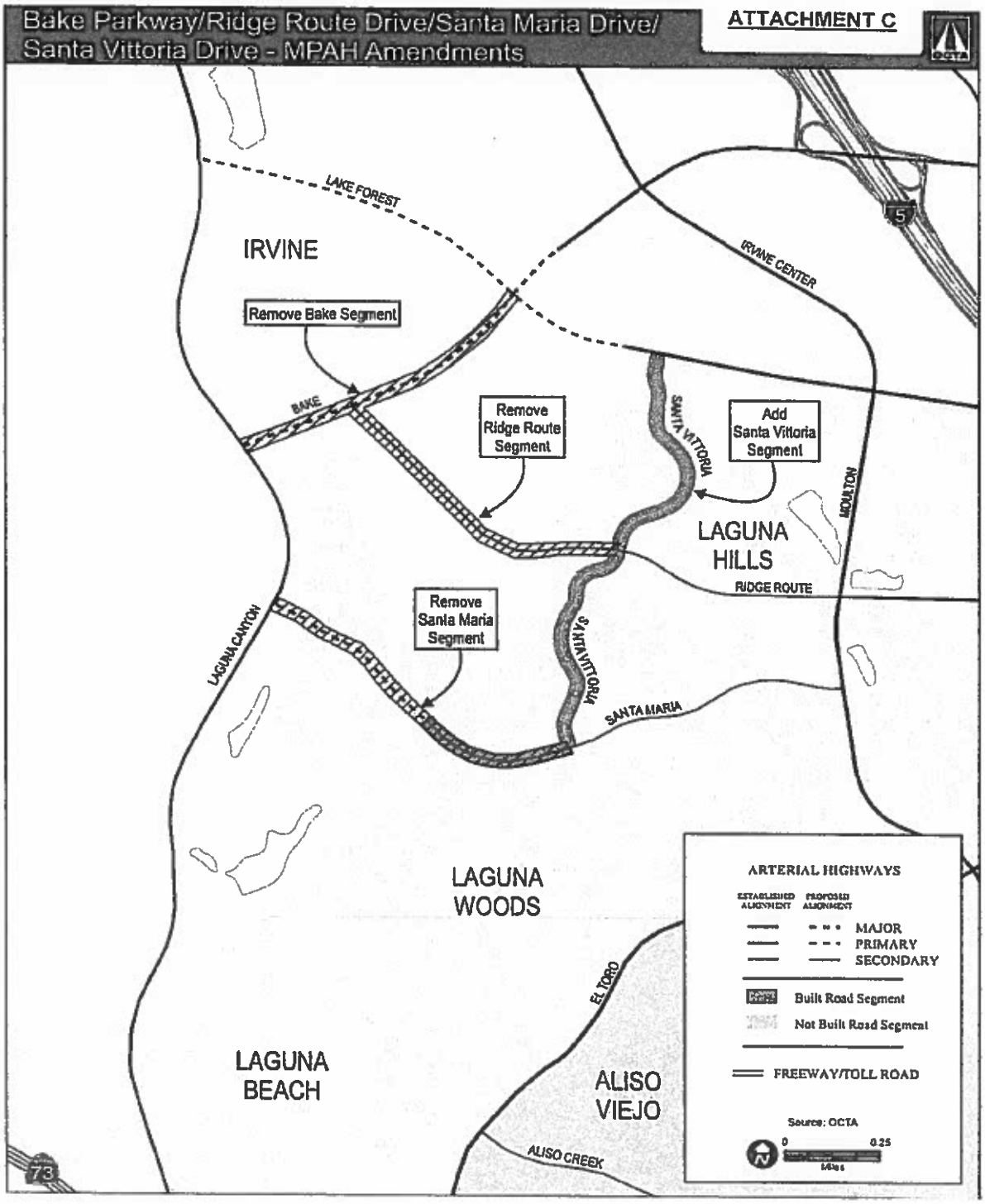
EXHIBIT B: IMPACTED INTERSECTIONS SHARE COST ALLOCATION

Impacted Intersection	Total Improvement Cost	Share	Share Cost Allocation
Bake Parkway/ Research Drive (City of Irvine)	$1,184,000	5%	$1,184,000 * .05 = **$59,200**
Paseo de Valencia/ Avenida de la Carlota (City of Laguna Hills); and El Toro Road/ Avenida de la Carlota (City of Laguna Hills)	$2,349,560	15%	$2,349,560 *.15 = **$352,434**
Ridge Route Drive/Rockfield Boulevard (City of Lake Forest)	$190,000	7%	$190,000 * .07 = **$13,300**[1]

[1] The City of Lake Forest is not a CARITS Program participant. As a result, funding for this mitigation is not available through the CARITS Program. Instead, the City of Lake Forest agrees that it will fund this improvement, if needed in the future, through non-General Fund, grant-funding sources.

OCTA

EXHIBIT C: MPAH AMENDMENT MAP



Appendix B

Buildout Projection Calculations and Assumptions

Table B1: General Plan Land Use Assumptions

General Plan Designation	Maximum Density and/ or Floor Area Ratio	Effective Target Density and/ or Floor Area Ratio [1]	Persons Per Household [2]	Jobs Ratio (SF/Job)	Residential Distribution		Nonresidential Distribution			
					Single-Family	Multifamily	Retail	Office	Industrial	Public Facilities
Residential Designation										
Very Low Density Residential	0-2 du/ac	1 du/ac	2.97	-	100%	-	-	-		-
Low Density Residential	2-7 du/ac	6.8 du/ac	2.97	-	100%	-	-	-		-
Low-Medium Density Residential	7-15 du/ac	10.9 du/ac	2.97	-	100%	-	-	-		-
Medium Density Residential	15-25 du/ac	22 du/ac	2.97	-	30%	70%	-	-		-
High Density Residential	25-43 du/ac	38 du/ac	2.97	-	-	100%	-	-		-
Nonresidential Designations										
Commercial	1.0:1 FAR	0.25 FAR	-	450	-	-	60%	30%	5%	5%
Professional Office	1.2:1 FAR	0.30 FAR	-	300	-	-	5%	95%	-	-
Mixed-Use 32	32 du/ac 1.0:1 FAR	32 du/ac; 0.25 FAR	2.97	450	-	100%	40%	50%	-	10%
Mixed-Use 43 [3]	43 du/ac 1.2:1 FAR	36 du/ac (2); 0.40 FAR	2.97	450	-	100%	40%	50%	-	10%
Mixed-Use 60	60 du/ac 2.0:1 FAR	48 du/ac; 0.50 FAR	2.97	450	-	100%	40%	50%	-	10%
Business Park	1.0:1 FAR	0.35 FAR	-	600	-	-	10%	50%	30%	10%
Mixed-Use Office	1.5:1 FAR	0.50 FAR	-	400	-	-	10%	90%	-	-
Light Industrial	0.60:1 FAR	0.35 FAR	-	600	-	-	-	20%	70%	10%
Urban Industrial 25	25 du/ac 1.0:1 FAR	22 du/ac; 0.40 FAR	2.97	600	30%	70%	10%	15%	65%	10%
Urban Industrial 43	43 du/ac 1.2:1 FAR	36 du/ac; 0.40 FAR	2.97	600	-	100%	10%	15%	65%	10%
Public Facility	1.2:1 FAR	0.05 FAR	-	1,000	-	-	-	-	-	100%
Limited Development Designations										
Community Park/Open Space	0.40:1 FAR	0.0025 FAR	-	1,000	-	-	-	-		100%
Regional Park/Open Space	0.10:1 FAR	0.0001 FAR		1,000	-	-	-	-		100%
Open Space	0.40:1 FAR	-	-	-	-	-	-	-		-
Lake	-	-	-	-	-	-	-	-		-
Transportation Corridor	0.20:1 FAR	-	-	-	-	-	-	-		-

(1) The effective target density and/or floor area ratio represents an expected average density or intensity of development across all designated acreage of a specific land use type. These figures reflect reasonable expectations of development patterns in Lake Forest based on past development trends, market demand, and land use objectives. Parcels may develop above or below the effective target density or intensity. For land use designations where residential and nonresidential development are allowed (Mixed-Use and Urban Industrial designations), the density represents the effective number of dwelling units assumed per acre across all acreage associated with that land use designation and the FAR represents the amount of nonresidential development (i.e., nonresidential development in addition to residential units). For example, the potential development projected for a 10 acre site designated MU-32 would be 320 units and 174,240 square feet of nonresidential development.

(2) Department of Finance, 2018.

(3) Effective density of MU-43 applies to areas designated as MU-43 not currently subject to Development Agreements. For Alternative 1, No Project, the number of dwelling units and nonresidential development reflected in potential development totals is consistent with the General Plan Amendments approved for the Opportunity Study Areas.

Table B2: Existing Nonresidential Development Assumptions

Existing Nonresidential Development Type [1]	Average Floor Area Ratio [1]	Jobs Ratio (SF/Job)	Nonresidential Distribution		
			Retail	Office	Other [3]
Commercial Recreation	0.30 FAR	418	100%		
Other Commercial	0.15 FAR	418	100%		
Retail Centers	0.15 FAR	418	100%		
Retail Stores and Commercial Services	0.15 FAR	418	100%		
Retail Strip Development	0.15 FAR	418	100%		
Commercial Storage	0.30 FAR	418			100%
General Office	0.30 FAR	315		100%	
Industrial	0.30 FAR	454			100%
Mixed Commercial and Industrial	0.25 FAR	425	30%	30%	40%
Hotels and Motels [2]	N/A	418	100%		
Public Facilities [3]	N/A	454			100%

(1) Existing Land Use Data, Southern California Association of Governments, 2016.

(2) Actual Hotel and Motel development of 520,000 square feet reflected in Existing Development totals, estimated FAR not applicable.

(3) For Existing Development estimates, a figure of 750,000 square feet of public facility development was used to allow for consistent comparisons against the Land Use Themes. Public facilities typically have very low development intensity and employment density compared to their total acreage. As part of the Environmental Impact Report, the analysis, including technical studies, will rely on actual employment and student population totals (not square footage) to measure and evaluate impacts associated with public facilities. This is a more accurate and appropriate way of evaluating impacts compared to intensity and square footage assumptions.

Appendix C

Air Quality, Greenhouse Gas, and Energy Modeling

Appendix B
CalEEMod Non-Default Parameters and Assumptions

Proposed Project Scenario

Note: Non-default CalEEMod parameters are identified below:

- Project Location: Orange County
- Climate Zone: 8
- Land Use Setting: Urban
- Operational Year: 2040
- Utility Company: Southern California Edison

- Land Uses:

Land Use Type and Subtype	Size	Metric	Lot Acreage	Square Footage	Population
Single Family Housing	17,023.00	Dwelling Unit	2,499.00	30,641,400.00	50559
Condo/Townhouse	9,589.00	Dwelling Unit	880.00	9,589,000.00	28481
Apartments Mid Rise	7,931.00	Dwelling Unit	361.00	7,931,000.00	23555
Apartments High Rise	620.00	Dwelling Unit	16.00	620,000.00	1840
Strip Mall	3,054.33	1000sqft	280.00	3,054,326.00	0
General Office Building	110.40	1000sqft	8.00	110,398.00	0
Office Park	4,545.82	1000sqft	298.00	4,545,819.00	0
General Light Industry	9,565.60	1000sqft	627.00	9,565,602.00	0
Library	811.51	1000sqft	373.00	811,507.00	0
Apartments Mid Rise	3,234.00	Dwelling Unit	101.00	3,234,000.00	9605
Apartments Mid Rise	7,567.00	Dwelling Unit	295.00	7,567,000.00	22473
Apartments High Rise	3,265.00	Dwelling Unit	68.00	3,265,000.00	9696
General Office Building	513.72	1000sqft	24.00	513,715.00	0
Apartments Mid Rise	1,155.00	Dwelling Unit	52.00	1,155,000.00	3430
Apartments High Rise	950.00	Dwelling Unit	26.00	950,000.00	2823
City Park	249.00	Acre	249.00	10,846,440.00	0
City Park	1,939.00	Acre	1,939.00	84,462,840.00	0
City Park	877.00	Acre	877.00	38,202,120.00	0
TOTALS			**8,973**	**217,065,167**	**152,462**

Notes: Land uses, size, lot acreages, square footages, and population based on what was provided by project applicant for Planning Area Buildout Potential (see Chapter 2.0: Project Description, Table 2.0-3: Planning Area Buildout Potential. Land uses types and subtypes were selected based on best fit from the available options provided by CalEEMod. Mixed Use land uses were assumed to develop the residential land uses allowed under their land use, for the purposes of modeling. The following land uses were not modeled in CalEEMod, since their uses were captured by the model separately (e.g. within the other land uses that were modeled): Lake, Transportation Corridor, and Right-of-way land uses.

- Woodstoves - No hearths or fireplaces (not permitted in SCAQMD's jurisdiction).
- Construction:
    - Construction schedule assumes buildout by 12/31/2040.
    - Grading - Assumes grading occurs over entire Planning Area (10,742 acres).
    - Construction trips and VMT: For 'Building Construction' & 'Architectural Coating' phases: for residential uses, assumed 24 worker & 8 vendor trips per housing unit/day. For nonresidential uses, assumed 8 worker trips & 3 vendor trips per 1000 sf/day.
    - Construction schedule provided as follows (simplified for the purposes of modeling):

Phase Number	Phase Name	Start Date	End Date	Days/Week	Num Days
1	Site Preparation	6/1/2020	6/1/2021	5	262
2	Grading	6/2/2021	6/1/2022	5	261
3	Building Construction	6/2/2023	6/1/2038	5	3913
4	Paving	6/2/2022	6/1/2023	5	261
5	Architectural Coating	6/2/2038	12/31/2040	5	674

Lake Forest General Plan Buildout Year (2040)

Orange County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	17,023.00	Dwelling Unit	2,499.00	30,641,400.00	50559
Condo/Townhouse	9,589.00	Dwelling Unit	880.00	9,589,000.00	28481
Apartments Mid Rise	7,931.00	Dwelling Unit	361.00	7,931,000.00	23555
Apartments High Rise	620.00	Dwelling Unit	16.00	620,000.00	1840
Strip Mall	3,054.33	1000sqft	280.00	3,054,326.00	0
General Office Building	110.40	1000sqft	8.00	110,398.00	0
Office Park	4,545.82	1000sqft	298.00	4,545,819.00	0
General Light Industry	9,565.60	1000sqft	627.00	9,565,602.00	0
Library	811.51	1000sqft	373.00	811,507.00	0
Apartments Mid Rise	3,234.00	Dwelling Unit	101.00	3,234,000.00	9605
Apartments Mid Rise	7,567.00	Dwelling Unit	295.00	7,567,000.00	22473
Apartments High Rise	3,265.00	Dwelling Unit	68.00	3,265,000.00	9696
General Office Building	513.72	1000sqft	24.00	513,715.00	0
Apartments Mid Rise	1,155.00	Dwelling Unit	52.00	1,155,000.00	3430
Apartments High Rise	950.00	Dwelling Unit	26.00	950,000.00	2823
City Park	249.00	Acre	249.00	10,846,440.00	0
City Park	1,939.00	Acre	1,939.00	84,462,840.00	0
City Park	877.00	Acre	877.00	38,202,120.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Values as provided by the City of Lake Forest. Land uses types were selected based on best proxy for the land use designations provided. Unit amounts, lot acreages, and population provided by the City.

Construction Phase - Construction schedule asssumes buildout by 12/31/2040.

Grading - Assumes grading occurs over entire Planning Area (10,742 acres).

Trips and VMT - For 'Building Construction' & 'Architectural Coating' phases: for res. uses, assumes 24 worker & 8 vendor trips per housing unit/day. For non-res. uses, assumes 8 worker trips & 3 vendor trips per 1000 sf/day. =199 daily worker 68 daily vendor trips

Woodstoves - No hearths or fireplaces (not permitted in SCAQMD's jurisdiction).

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	11,000.00	674.00
tblConstructionPhase	NumDays	155,000.00	3,913.00
tblConstructionPhase	NumDays	15,500.00	261.00
tblConstructionPhase	NumDays	11,000.00	261.00
tblConstructionPhase	NumDays	6,000.00	262.00
tblConstructionPhase	PhaseEndDate	8/9/2819	12/31/2040
tblConstructionPhase	PhaseEndDate	4/12/2735	6/1/2038
tblConstructionPhase	PhaseEndDate	2/24/2141	6/1/2022
tblConstructionPhase	PhaseEndDate	6/10/2777	6/1/2023
tblConstructionPhase	PhaseEndDate	9/26/2081	6/1/2021
tblConstructionPhase	PhaseStartDate	6/11/2777	6/2/2038

tblConstructionPhase	PhaseStartDate	2/25/2141	6/2/2023
tblConstructionPhase	PhaseStartDate	9/27/2081	6/2/2021
tblConstructionPhase	PhaseStartDate	4/13/2735	6/2/2022
tblConstructionPhase	PhaseStartDate	9/28/2058	6/1/2020
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	4,109.75	0.00
tblFireplaces	NumberGas	16,903.95	0.00
tblFireplaces	NumberGas	8,150.65	0.00
tblFireplaces	NumberGas	14,469.55	0.00
tblFireplaces	NumberNoFireplace	483.50	0.00
tblFireplaces	NumberNoFireplace	1,988.70	0.00
tblFireplaces	NumberNoFireplace	958.90	0.00
tblFireplaces	NumberNoFireplace	1,702.30	0.00
tblFireplaces	NumberWood	241.75	0.00
tblFireplaces	NumberWood	994.35	0.00
tblFireplaces	NumberWood	479.45	0.00
tblFireplaces	NumberWood	851.15	0.00
tblGrading	AcresOfGrading	652.50	10,742.00
tblLandUse	LandUseSquareFeet	3,054,330.00	3,054,326.00
tblLandUse	LandUseSquareFeet	110,400.00	110,398.00
tblLandUse	LandUseSquareFeet	4,545,820.00	4,545,819.00
tblLandUse	LandUseSquareFeet	9,565,600.00	9,565,602.00
tblLandUse	LotAcreage	5,526.95	2,499.00
tblLandUse	LotAcreage	599.31	880.00

tblLandUse	LotAcreage	208.71	361.00
tblLandUse	LotAcreage	10.00	16.00
tblLandUse	LotAcreage	70.12	280.00
tblLandUse	LotAcreage	2.53	8.00
tblLandUse	LotAcreage	104.36	298.00
tblLandUse	LotAcreage	219.60	627.00
tblLandUse	LotAcreage	18.63	373.00
tblLandUse	LotAcreage	85.11	101.00
tblLandUse	LotAcreage	199.13	295.00
tblLandUse	LotAcreage	52.66	68.00
tblLandUse	LotAcreage	11.79	24.00
tblLandUse	LotAcreage	30.39	52.00
tblLandUse	LotAcreage	15.32	26.00
tblLandUse	Population	48,686.00	50,559.00
tblLandUse	Population	27,425.00	28,481.00
tblLandUse	Population	22,683.00	23,555.00
tblLandUse	Population	1,773.00	1,840.00
tblLandUse	Population	9,249.00	9,605.00
tblLandUse	Population	21,642.00	22,473.00
tblLandUse	Population	9,338.00	9,696.00
tblLandUse	Population	3,303.00	3,430.00
tblLandUse	Population	2,717.00	2,823.00
tblTripsAndVMT	VendorTripNumber	30,419.00	68.00
tblTripsAndVMT	WorkerTripNumber	93,897.00	199.00
tblTripsAndVMT	WorkerTripNumber	18,779.00	199.00
tblWoodstoves	NumberCatalytic	241.75	0.00
tblWoodstoves	NumberCatalytic	994.35	0.00

tblWoodstoves	NumberCatalytic	479.45	0.00
tblWoodstoves	NumberCatalytic	851.15	0.00
tblWoodstoves	NumberNoncatalytic	241.75	0.00
tblWoodstoves	NumberNoncatalytic	994.35	0.00
tblWoodstoves	NumberNoncatalytic	479.45	0.00
tblWoodstoves	NumberNoncatalytic	851.15	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3193	3.2699	1.6995	3.0700e-003	1.4063	0.1693	1.5756	0.7687	0.1558	0.9245	0.0000	270.5855	270.5855	0.0836	0.0000	272.6743
2021	0.5398	5.7426	3.5764	7.0500e-003	7.1597	0.2625	7.4221	1.4118	0.2415	1.6533	0.0000	620.3876	620.3876	0.1937	0.0000	625.2305
2022	0.2873	2.9480	2.7358	5.3000e-003	6.0455	0.1316	6.1771	0.8003	0.1211	0.9213	0.0000	466.3041	466.3041	0.1449	0.0000	469.9257
2023	0.2371	2.0207	2.5391	5.9600e-003	0.2062	0.0822	0.2884	0.0555	0.0767	0.1322	0.0000	537.6767	537.6767	0.0885	0.0000	539.8891
2024	0.2911	2.4039	2.9310	7.9400e-003	0.3423	0.0829	0.4251	0.0922	0.0779	0.1701	0.0000	721.1525	721.1525	0.0910	0.0000	723.4279

Lake Forest General Plan Buildout Year (2040) - Orange County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2025	0.2725	2.2559	2.8662	7.8000e-003	0.3410	0.0713	0.4123	0.0918	0.0671	0.1589	0.0000	708.6841	708.6841	0.0897	0.0000	710.9273
2026	0.2690	2.2447	2.8300	7.7100e-003	0.3410	0.0712	0.4122	0.0918	0.0670	0.1588	0.0000	700.1355	700.1355	0.0892	0.0000	702.3664
2027	0.2657	2.2343	2.7983	7.6200e-003	0.3410	0.0711	0.4121	0.0918	0.0669	0.1587	0.0000	692.6325	692.6325	0.0888	0.0000	694.8524
2028	0.2612	2.2168	2.7602	7.5200e-003	0.3397	0.0707	0.4104	0.0915	0.0665	0.1580	0.0000	683.4846	683.4846	0.0881	0.0000	685.6861
2029	0.2584	2.2170	2.7447	7.4900e-003	0.3410	0.0709	0.4118	0.0918	0.0667	0.1585	0.0000	680.3911	680.3911	0.0880	0.0000	682.5922
2030	0.2469	1.6174	2.7300	7.9500e-003	0.3410	0.0213	0.3622	0.0918	0.0211	0.1129	0.0000	715.7432	715.7432	0.0303	0.0000	716.5015
2031	0.2425	1.6090	2.7074	7.9000e-003	0.3410	0.0212	0.3621	0.0918	0.0210	0.1128	0.0000	711.0233	711.0233	0.0300	0.0000	711.7744
2032	0.2396	1.6086	2.6976	7.8900e-003	0.3423	0.0211	0.3634	0.0922	0.0210	0.1132	0.0000	709.9969	709.9969	0.0299	0.0000	710.7447
2033	0.2346	1.5904	2.6597	7.7900e-003	0.3397	0.0209	0.3606	0.0915	0.0208	0.1123	0.0000	701.3735	701.3735	0.0295	0.0000	702.1101
2034	0.2318	1.5850	2.6432	7.7600e-003	0.3397	0.0208	0.3605	0.0915	0.0207	0.1122	0.0000	698.6292	698.6292	0.0293	0.0000	699.3610
2035	0.2183	1.4858	2.6340	7.7600e-003	0.3410	0.0133	0.3543	0.0918	0.0132	0.1050	0.0000	699.0027	699.0027	0.0282	0.0000	699.7084
2036	0.2191	1.4915	2.6441	7.7900e-003	0.3423	0.0134	0.3556	0.0922	0.0133	0.1054	0.0000	701.6808	701.6808	0.0283	0.0000	702.3893
2037	0.2183	1.4858	2.6340	7.7600e-003	0.3410	0.0133	0.3543	0.0918	0.0132	0.1050	0.0000	699.0027	699.0027	0.0282	0.0000	699.7084
2038	65.8271	0.6857	1.4216	4.4800e-003	0.3082	6.8000e-003	0.3150	0.0824	6.7200e-003	0.0891	0.0000	402.7943	402.7943	0.0134	0.0000	403.1284
2039	111.7096	0.1206	0.5636	2.1500e-003	0.2840	2.2000e-003	0.2862	0.0754	2.1300e-003	0.0776	0.0000	192.9639	192.9639	2.8600e-003	0.0000	193.0355
2040	112.1307	0.1138	0.5225	2.0900e-003	0.2851	1.6900e-003	0.2868	0.0757	1.6300e-003	0.0773	0.0000	187.6659	187.6659	2.5000e-003	0.0000	187.7285
Maximum	**112.1307**	**5.7426**	**3.5764**	**7.9500e-003**	**7.1597**	**0.2625**	**7.4221**	**1.4118**	**0.2415**	**1.6533**	**0.0000**	**721.1525**	**721.1525**	**0.1937**	**0.0000**	**723.4279**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.3193	3.2699	1.6995	3.0700e-003	1.4063	0.1693	1.5756	0.7687	0.1558	0.9245	0.0000	270.5852	270.5852	0.0836	0.0000	272.6740
2021	0.5398	5.7426	3.5764	7.0500e-003	7.1597	0.2625	7.4221	1.4118	0.2415	1.6533	0.0000	620.3869	620.3869	0.1937	0.0000	625.2297
2022	0.2873	2.9480	2.7358	5.3000e-003	6.0455	0.1316	6.1771	0.8003	0.1211	0.9213	0.0000	466.3035	466.3035	0.1449	0.0000	469.9252
2023	0.2371	2.0207	2.5391	5.9600e-003	0.2062	0.0822	0.2884	0.0555	0.0767	0.1322	0.0000	537.6764	537.6764	0.0885	0.0000	539.8888
2024	0.2911	2.4039	2.9310	7.9400e-003	0.3423	0.0829	0.4251	0.0922	0.0779	0.1701	0.0000	721.1522	721.1522	0.0910	0.0000	723.4276
2025	0.2725	2.2559	2.8662	7.8000e-003	0.3410	0.0713	0.4123	0.0918	0.0671	0.1589	0.0000	708.6837	708.6837	0.0897	0.0000	710.9269
2026	0.2690	2.2447	2.8300	7.7100e-003	0.3410	0.0712	0.4122	0.0918	0.0670	0.1588	0.0000	700.1351	700.1351	0.0892	0.0000	702.3661
2027	0.2657	2.2343	2.7983	7.6200e-003	0.3410	0.0711	0.4121	0.0918	0.0669	0.1587	0.0000	692.6321	692.6321	0.0888	0.0000	694.8520
2028	0.2612	2.2168	2.7602	7.5200e-003	0.3397	0.0707	0.4104	0.0915	0.0665	0.1580	0.0000	683.4842	683.4842	0.0881	0.0000	685.6857
2029	0.2584	2.2170	2.7447	7.4900e-003	0.3410	0.0709	0.4118	0.0918	0.0667	0.1585	0.0000	680.3908	680.3908	0.0880	0.0000	682.5919
2030	0.2469	1.6174	2.7300	7.9500e-003	0.3410	0.0213	0.3622	0.0918	0.0211	0.1129	0.0000	715.7428	715.7428	0.0303	0.0000	716.5011
2031	0.2425	1.6090	2.7074	7.9000e-003	0.3410	0.0212	0.3621	0.0918	0.0210	0.1128	0.0000	711.0229	711.0229	0.0300	0.0000	711.7740
2032	0.2396	1.6086	2.6976	7.8900e-003	0.3423	0.0211	0.3634	0.0922	0.0210	0.1132	0.0000	709.9965	709.9965	0.0299	0.0000	710.7443
2033	0.2346	1.5904	2.6597	7.7900e-003	0.3397	0.0209	0.3606	0.0915	0.0208	0.1123	0.0000	701.3731	701.3731	0.0295	0.0000	702.1097
2034	0.2318	1.5850	2.6431	7.7600e-003	0.3397	0.0208	0.3605	0.0915	0.0207	0.1122	0.0000	698.6288	698.6288	0.0293	0.0000	699.3606

Lake Forest General Plan Buildout Year (2040) - Orange County, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2035	0.2183	1.4858	2.6340	7.7600e-003	0.3410	0.0133	0.3543	0.0918	0.0132	0.1050	0.0000	699.0023	699.0023	0.0282	0.0000	699.7080
2036	0.2191	1.4915	2.6441	7.7900e-003	0.3423	0.0134	0.3556	0.0922	0.0133	0.1054	0.0000	701.6804	701.6804	0.0283	0.0000	702.3888
2037	0.2183	1.4858	2.6340	7.7600e-003	0.3410	0.0133	0.3543	0.0918	0.0132	0.1050	0.0000	699.0023	699.0023	0.0282	0.0000	699.7080
2038	65.8271	0.6857	1.4216	4.4800e-003	0.3082	6.8000e-003	0.3150	0.0824	6.7200e-003	0.0891	0.0000	402.7941	402.7941	0.0134	0.0000	403.1283
2039	111.7096	0.1206	0.5636	2.1500e-003	0.2840	2.2000e-003	0.2862	0.0754	2.1300e-003	0.0776	0.0000	192.9639	192.9639	2.8600e-003	0.0000	193.0354
2040	112.1307	0.1138	0.5225	2.0900e-003	0.2851	1.6900e-003	0.2868	0.0757	1.6300e-003	0.0773	0.0000	187.6658	187.6658	2.5000e-003	0.0000	187.7285
Maximum	**112.1307**	**5.7426**	**3.5764**	**7.9500e-003**	**7.1597**	**0.2625**	**7.4221**	**1.4118**	**0.2415**	**1.6533**	**0.0000**	**721.1522**	**721.1522**	**0.1937**	**0.0000**	**723.4276**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**6-1-2020**	**8-31-2020**	1.5314	1.5314
2	**9-1-2020**	**11-30-2020**	1.5150	1.5150
3	**12-1-2020**	**2-28-2021**	1.4539	1.4539
4	**3-1-2021**	**5-31-2021**	1.4619	1.4619
5	**6-1-2021**	**8-31-2021**	1.6639	1.6639
6	**9-1-2021**	**11-30-2021**	1.6483	1.6483
7	**12-1-2021**	**2-28-2022**	1.4590	1.4590
8	**3-1-2022**	**5-31-2022**	1.3991	1.3991
9	**6-1-2022**	**8-31-2022**	0.4152	0.4152
10	**9-1-2022**	**11-30-2022**	0.4002	0.4002

11	**12-1-2022**	**2-28-2023**	0.3747	0.3747
12	**3-1-2023**	**5-31-2023**	0.3714	0.3714
13	**6-1-2023**	**8-31-2023**	0.7074	0.7074
14	**9-1-2023**	**11-30-2023**	0.7057	0.7057
15	**12-1-2023**	**2-29-2024**	0.6817	0.6817
16	**3-1-2024**	**5-31-2024**	0.6739	0.6739
17	**6-1-2024**	**8-31-2024**	0.6728	0.6728
18	**9-1-2024**	**11-30-2024**	0.6676	0.6676
19	**12-1-2024**	**2-28-2025**	0.6361	0.6361
20	**3-1-2025**	**5-31-2025**	0.6346	0.6346
21	**6-1-2025**	**8-31-2025**	0.6335	0.6335
22	**9-1-2025**	**11-30-2025**	0.6287	0.6287
23	**12-1-2025**	**2-28-2026**	0.6205	0.6205
24	**3-1-2026**	**5-31-2026**	0.6310	0.6310
25	**6-1-2026**	**8-31-2026**	0.6300	0.6300
26	**9-1-2026**	**11-30-2026**	0.6252	0.6252
27	**12-1-2026**	**2-28-2027**	0.6170	0.6170
28	**3-1-2027**	**5-31-2027**	0.6276	0.6276
29	**6-1-2027**	**8-31-2027**	0.6267	0.6267
30	**9-1-2027**	**11-30-2027**	0.6218	0.6218
31	**12-1-2027**	**2-29-2028**	0.6207	0.6207
32	**3-1-2028**	**5-31-2028**	0.6246	0.6246
33	**6-1-2028**	**8-31-2028**	0.6237	0.6237
34	**9-1-2028**	**11-30-2028**	0.6187	0.6187
35	**12-1-2028**	**2-28-2029**	0.6108	0.6108
36	**3-1-2029**	**5-31-2029**	0.6216	0.6216
37	**6-1-2029**	**8-31-2029**	0.6207	0.6207

38	**9-1-2029**	**11-30-2029**	0.6157	0.6157
39	**12-1-2029**	**2-28-2030**	0.5111	0.5111
40	**3-1-2030**	**5-31-2030**	0.4678	0.4678
41	**6-1-2030**	**8-31-2030**	0.4670	0.4670
42	**9-1-2030**	**11-30-2030**	0.4635	0.4635
43	**12-1-2030**	**2-28-2031**	0.4571	0.4571
44	**3-1-2031**	**5-31-2031**	0.4646	0.4646
45	**6-1-2031**	**8-31-2031**	0.4639	0.4639
46	**9-1-2031**	**11-30-2031**	0.4603	0.4603
47	**12-1-2031**	**2-29-2032**	0.4593	0.4593
48	**3-1-2032**	**5-31-2032**	0.4621	0.4621
49	**6-1-2032**	**8-31-2032**	0.4614	0.4614
50	**9-1-2032**	**11-30-2032**	0.4577	0.4577
51	**12-1-2032**	**2-28-2033**	0.4518	0.4518
52	**3-1-2033**	**5-31-2033**	0.4598	0.4598
53	**6-1-2033**	**8-31-2033**	0.4591	0.4591
54	**9-1-2033**	**11-30-2033**	0.4554	0.4554
55	**12-1-2033**	**2-28-2034**	0.4497	0.4497
56	**3-1-2034**	**5-31-2034**	0.4578	0.4578
57	**6-1-2034**	**8-31-2034**	0.4572	0.4572
58	**9-1-2034**	**11-30-2034**	0.4534	0.4534
59	**12-1-2034**	**2-28-2035**	0.4296	0.4296
60	**3-1-2035**	**5-31-2035**	0.4276	0.4276
61	**6-1-2035**	**8-31-2035**	0.4271	0.4271
62	**9-1-2035**	**11-30-2035**	0.4236	0.4236
63	**12-1-2035**	**2-29-2036**	0.4241	0.4241
64	**3-1-2036**	**5-31-2036**	0.4276	0.4276

65	**6-1-2036**	**8-31-2036**	0.4271	0.4271
66	**9-1-2036**	**11-30-2036**	0.4236	0.4236
67	**12-1-2036**	**2-28-2037**	0.4195	0.4195
68	**3-1-2037**	**5-31-2037**	0.4276	0.4276
69	**6-1-2037**	**8-31-2037**	0.4271	0.4271
70	**9-1-2037**	**11-30-2037**	0.4236	0.4236
71	**12-1-2037**	**2-28-2038**	0.4195	0.4195
72	**3-1-2038**	**5-31-2038**	0.4276	0.4276
73	**6-1-2038**	**8-31-2038**	27.9612	27.9612
74	**9-1-2038**	**11-30-2038**	27.9582	27.9582
75	**12-1-2038**	**2-28-2039**	27.6517	27.6517
76	**3-1-2039**	**5-31-2039**	28.2646	28.2646
77	**6-1-2039**	**8-31-2039**	28.2638	28.2638
78	**9-1-2039**	**11-30-2039**	27.9582	27.9582
79	**12-1-2039**	**2-29-2040**	27.9562	27.9562
80	**3-1-2040**	**5-31-2040**	28.2606	28.2606
81	**6-1-2040**	**8-31-2040**	28.2600	28.2600
82	**9-1-2040**	**9-30-2040**	9.2152	9.2152
		Highest	28.2646	28.2646

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	348.3199	6.1458	531.4281	0.0280		2.9216	2.9216		2.9216	2.9216	0.0000	865.2872	865.2872	0.8447	0.0000	886.4037
Energy	6.3162	54.7996	29.0155	0.3445		4.3639	4.3639		4.3639	4.3639	0.0000	216,638.6488	216,638.6488	7.5613	2.4625	217,561.5115
Mobile	185.3680	817.3934	2,473.0015	8.8023	765.1668	8.9151	774.0819	204.9122	8.3651	213.2774	0.0000	809,930.6533	809,930.6533	34.9735	0.0000	810,804.9902
Waste						0.0000	0.0000		0.0000	0.0000	11,651.6001	0.0000	11,651.6001	688.5898	0.0000	28,866.3460
Water						0.0000	0.0000		0.0000	0.0000	2,134.2200	50,925.8377	53,060.0577	221.3073	5.6109	60,264.7865
Total	**540.0042**	**878.3388**	**3,033.4450**	**9.1748**	**765.1668**	**16.2006**	**781.3674**	**204.9122**	**15.6507**	**220.5629**	**13,785.8200**	**1,078,360.4270**	**1,092,146.2471**	**953.2766**	**8.0734**	**1,118,384.0379**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	348.3199	6.1458	531.4281	0.0280		2.9216	2.9216		2.9216	2.9216	0.0000	865.2872	865.2872	0.8447	0.0000	886.4037
Energy	6.3162	54.7996	29.0155	0.3445		4.3639	4.3639		4.3639	4.3639	0.0000	216,638.6488	216,638.6488	7.5613	2.4625	217,561.5115
Mobile	185.3680	817.3934	2,473.0015	8.8023	765.1668	8.9151	774.0819	204.9122	8.3651	213.2774	0.0000	809,930.6533	809,930.6533	34.9735	0.0000	810,804.9902
Waste						0.0000	0.0000		0.0000	0.0000	11,651.6001	0.0000	11,651.6001	688.5898	0.0000	28,866.3460
Water						0.0000	0.0000		0.0000	0.0000	2,134.2200	50,925.8377	53,060.0577	221.3073	5.6109	60,264.7865
Total	**540.0042**	**878.3388**	**3,033.4450**	**9.1748**	**765.1668**	**16.2006**	**781.3674**	**204.9122**	**15.6507**	**220.5629**	**13,785.8200**	**1,078,360.4270**	**1,092,146.2471**	**953.2766**	**8.0734**	**1,118,384.0379**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2020	6/1/2021	5	262	
2	Grading	Grading	6/2/2021	6/1/2022	5	261	
3	Building Construction	Building Construction	6/2/2023	6/1/2038	5	3913	
4	Paving	Paving	6/2/2022	6/1/2023	5	261	
5	Architectural Coating	Architectural Coating	6/2/2038	12/31/2040	5	674	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10742

Acres of Paving: 0

Residential Indoor: 131,528,610; Residential Outdoor: 43,842,870; Non-Residential Indoor: 27,902,051; Non-Residential Outdoor: 9,300,684; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	199.00	68.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	199.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3911	0.0000	1.3911	0.7647	0.0000	0.7647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3139	3.2661	1.6566	2.9300e-003		0.1692	0.1692		0.1557	0.1557	0.0000	257.4162	257.4162	0.0833	0.0000	259.4976
Total	**0.3139**	**3.2661**	**1.6566**	**2.9300e-003**	**1.3911**	**0.1692**	**1.5603**	**0.7647**	**0.1557**	**0.9203**	**0.0000**	**257.4162**	**257.4162**	**0.0833**	**0.0000**	**259.4976**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-003	3.7800e-003	0.0430	1.5000e-004	0.0152	1.0000e-004	0.0153	4.0400e-003	9.0000e-005	4.1400e-003	0.0000	13.1692	13.1692	3.0000e-004	0.0000	13.1767
Total	**5.4000e-003**	**3.7800e-003**	**0.0430**	**1.5000e-004**	**0.0152**	**1.0000e-004**	**0.0153**	**4.0400e-003**	**9.0000e-005**	**4.1400e-003**	**0.0000**	**13.1692**	**13.1692**	**3.0000e-004**	**0.0000**	**13.1767**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3911	0.0000	1.3911	0.7647	0.0000	0.7647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3139	3.2661	1.6566	2.9300e-003		0.1692	0.1692		0.1557	0.1557	0.0000	257.4159	257.4159	0.0833	0.0000	259.4973
Total	**0.3139**	**3.2661**	**1.6566**	**2.9300e-003**	**1.3911**	**0.1692**	**1.5603**	**0.7647**	**0.1557**	**0.9203**	**0.0000**	**257.4159**	**257.4159**	**0.0833**	**0.0000**	**259.4973**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-003	3.7800e-003	0.0430	1.5000e-004	0.0152	1.0000e-004	0.0153	4.0400e-003	9.0000e-005	4.1400e-003	0.0000	13.1692	13.1692	3.0000e-004	0.0000	13.1767
Total	**5.4000e-003**	**3.7800e-003**	**0.0430**	**1.5000e-004**	**0.0152**	**1.0000e-004**	**0.0153**	**4.0400e-003**	**9.0000e-005**	**4.1400e-003**	**0.0000**	**13.1692**	**13.1692**	**3.0000e-004**	**0.0000**	**13.1767**

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.9756	0.0000	0.9756	0.5363	0.0000	0.5363	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2100	2.1868	1.1423	2.0500e-003		0.1104	0.1104		0.1016	0.1016	0.0000	180.5529	180.5529	0.0584	0.0000	182.0127
Total	**0.2100**	**2.1868**	**1.1423**	**2.0500e-003**	**0.9756**	**0.1104**	**1.0860**	**0.5363**	**0.1016**	**0.6378**	**0.0000**	**180.5529**	**180.5529**	**0.0584**	**0.0000**	**182.0127**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5600e-003	2.3900e-003	0.0279	1.0000e-004	0.0107	7.0000e-005	0.0107	2.8300e-003	6.0000e-005	2.9000e-003	0.0000	8.9151	8.9151	1.9000e-004	0.0000	8.9199
Total	**3.5600e-003**	**2.3900e-003**	**0.0279**	**1.0000e-004**	**0.0107**	**7.0000e-005**	**0.0107**	**2.8300e-003**	**6.0000e-005**	**2.9000e-003**	**0.0000**	**8.9151**	**8.9151**	**1.9000e-004**	**0.0000**	**8.9199**

3.2 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.9756	0.0000	0.9756	0.5363	0.0000	0.5363	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2100	2.1868	1.1423	2.0500e-003		0.1104	0.1104		0.1016	0.1016	0.0000	180.5527	180.5527	0.0584	0.0000	182.0125
Total	**0.2100**	**2.1868**	**1.1423**	**2.0500e-003**	**0.9756**	**0.1104**	**1.0860**	**0.5363**	**0.1016**	**0.6378**	**0.0000**	**180.5527**	**180.5527**	**0.0584**	**0.0000**	**182.0125**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5600e-003	2.3900e-003	0.0279	1.0000e-004	0.0107	7.0000e-005	0.0107	2.8300e-003	6.0000e-005	2.9000e-003	0.0000	8.9151	8.9151	1.9000e-004	0.0000	8.9199
Total	**3.5600e-003**	**2.3900e-003**	**0.0279**	**1.0000e-004**	**0.0107**	**7.0000e-005**	**0.0107**	**2.8300e-003**	**6.0000e-005**	**2.9000e-003**	**0.0000**	**8.9151**	**8.9151**	**1.9000e-004**	**0.0000**	**8.9199**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.1566	0.0000	6.1566	0.8683	0.0000	0.8683	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3206	3.5496	2.3622	4.7400e-003		0.1519	0.1519		0.1397	0.1397	0.0000	416.8866	416.8866	0.1348	0.0000	420.2574
Total	**0.3206**	**3.5496**	**2.3622**	**4.7400e-003**	**6.1566**	**0.1519**	**6.3085**	**0.8683**	**0.1397**	**1.0080**	**0.0000**	**416.8866**	**416.8866**	**0.1348**	**0.0000**	**420.2574**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6100e-003	3.7700e-003	0.0440	1.6000e-004	0.0168	1.1000e-004	0.0169	4.4600e-003	1.0000e-004	4.5600e-003	0.0000	14.0330	14.0330	3.0000e-004	0.0000	14.0405
Total	**5.6100e-003**	**3.7700e-003**	**0.0440**	**1.6000e-004**	**0.0168**	**1.1000e-004**	**0.0169**	**4.4600e-003**	**1.0000e-004**	**4.5600e-003**	**0.0000**	**14.0330**	**14.0330**	**3.0000e-004**	**0.0000**	**14.0405**

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.1566	0.0000	6.1566	0.8683	0.0000	0.8683	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3206	3.5496	2.3622	4.7400e-003		0.1519	0.1519		0.1397	0.1397	0.0000	416.8861	416.8861	0.1348	0.0000	420.2569
Total	**0.3206**	**3.5496**	**2.3622**	**4.7400e-003**	**6.1566**	**0.1519**	**6.3085**	**0.8683**	**0.1397**	**1.0080**	**0.0000**	**416.8861**	**416.8861**	**0.1348**	**0.0000**	**420.2569**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.6100e-003	3.7700e-003	0.0440	1.6000e-004	0.0168	1.1000e-004	0.0169	4.4600e-003	1.0000e-004	4.5600e-003	0.0000	14.0330	14.0330	3.0000e-004	0.0000	14.0405
Total	**5.6100e-003**	**3.7700e-003**	**0.0440**	**1.6000e-004**	**0.0168**	**1.1000e-004**	**0.0169**	**4.4600e-003**	**1.0000e-004**	**4.5600e-003**	**0.0000**	**14.0330**	**14.0330**	**3.0000e-004**	**0.0000**	**14.0405**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.0211	0.0000	6.0211	0.7938	0.0000	0.7938	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1957	2.0976	1.5682	3.3500e-003		0.0883	0.0883		0.0812	0.0812	0.0000	294.4868	294.4868	0.0952	0.0000	296.8679
Total	**0.1957**	**2.0976**	**1.5682**	**3.3500e-003**	**6.0211**	**0.0883**	**6.1094**	**0.7938**	**0.0812**	**0.8750**	**0.0000**	**294.4868**	**294.4868**	**0.0952**	**0.0000**	**296.8679**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7400e-003	2.4100e-003	0.0289	1.1000e-004	0.0119	8.0000e-005	0.0119	3.1500e-003	7.0000e-005	3.2200e-003	0.0000	9.5389	9.5389	1.9000e-004	0.0000	9.5437
Total	**3.7400e-003**	**2.4100e-003**	**0.0289**	**1.1000e-004**	**0.0119**	**8.0000e-005**	**0.0119**	**3.1500e-003**	**7.0000e-005**	**3.2200e-003**	**0.0000**	**9.5389**	**9.5389**	**1.9000e-004**	**0.0000**	**9.5437**

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.0211	0.0000	6.0211	0.7938	0.0000	0.7938	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1957	2.0976	1.5682	3.3500e-003		0.0883	0.0883		0.0812	0.0812	0.0000	294.4865	294.4865	0.0952	0.0000	296.8676
Total	**0.1957**	**2.0976**	**1.5682**	**3.3500e-003**	**6.0211**	**0.0883**	**6.1094**	**0.7938**	**0.0812**	**0.8750**	**0.0000**	**294.4865**	**294.4865**	**0.0952**	**0.0000**	**296.8676**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7400e-003	2.4100e-003	0.0289	1.1000e-004	0.0119	8.0000e-005	0.0119	3.1500e-003	7.0000e-005	3.2200e-003	0.0000	9.5389	9.5389	1.9000e-004	0.0000	9.5437
Total	**3.7400e-003**	**2.4100e-003**	**0.0289**	**1.1000e-004**	**0.0119**	**8.0000e-005**	**0.0119**	**3.1500e-003**	**7.0000e-005**	**3.2200e-003**	**0.0000**	**9.5389**	**9.5389**	**1.9000e-004**	**0.0000**	**9.5437**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1187	1.0861	1.2264	2.0300e-003		0.0528	0.0528		0.0497	0.0497	0.0000	175.0126	175.0126	0.0416	0.0000	176.0534
Total	**0.1187**	**1.0861**	**1.2264**	**2.0300e-003**		**0.0528**	**0.0528**		**0.0497**	**0.0497**	**0.0000**	**175.0126**	**175.0126**	**0.0416**	**0.0000**	**176.0534**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0100	0.3471	0.1227	1.2000e-003	0.0323	4.2000e-004	0.0327	9.3200e-003	4.1000e-004	9.7300e-003	0.0000	118.9702	118.9702	9.0000e-003	0.0000	119.1952
Worker	0.0494	0.0304	0.3748	1.4100e-003	0.1649	1.0500e-003	0.1660	0.0438	9.6000e-004	0.0448	0.0000	127.6045	127.6045	2.4300e-003	0.0000	127.6651
Total	**0.0594**	**0.3776**	**0.4975**	**2.6100e-003**	**0.1973**	**1.4700e-003**	**0.1987**	**0.0531**	**1.3700e-003**	**0.0545**	**0.0000**	**246.5746**	**246.5746**	**0.0114**	**0.0000**	**246.8604**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1187	1.0861	1.2264	2.0300e-003		0.0528	0.0528		0.0497	0.0497	0.0000	175.0124	175.0124	0.0416	0.0000	176.0532
Total	**0.1187**	**1.0861**	**1.2264**	**2.0300e-003**		**0.0528**	**0.0528**		**0.0497**	**0.0497**	**0.0000**	**175.0124**	**175.0124**	**0.0416**	**0.0000**	**176.0532**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0100	0.3471	0.1227	1.2000e-003	0.0323	4.2000e-004	0.0327	9.3200e-003	4.1000e-004	9.7300e-003	0.0000	118.9702	118.9702	9.0000e-003	0.0000	119.1952
Worker	0.0494	0.0304	0.3748	1.4100e-003	0.1649	1.0500e-003	0.1660	0.0438	9.6000e-004	0.0448	0.0000	127.6045	127.6045	2.4300e-003	0.0000	127.6651
Total	**0.0594**	**0.3776**	**0.4975**	**2.6100e-003**	**0.1973**	**1.4700e-003**	**0.1987**	**0.0531**	**1.3700e-003**	**0.0545**	**0.0000**	**246.5746**	**246.5746**	**0.0114**	**0.0000**	**246.8604**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7223	303.7223	0.0718	0.0000	305.5179
Total	**0.1928**	**1.7611**	**2.1179**	**3.5300e-003**		**0.0803**	**0.0803**		**0.0756**	**0.0756**	**0.0000**	**303.7223**	**303.7223**	**0.0718**	**0.0000**	**305.5179**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0168	0.5947	0.2083	2.0600e-003	0.0561	7.2000e-004	0.0568	0.0162	6.9000e-004	0.0169	0.0000	204.7958	204.7958	0.0154	0.0000	205.1801
Worker	0.0816	0.0481	0.6048	2.3500e-003	0.2862	1.7900e-003	0.2880	0.0760	1.6400e-003	0.0776	0.0000	212.6344	212.6344	3.8200e-003	0.0000	212.7299
Total	**0.0984**	**0.6428**	**0.8132**	**4.4100e-003**	**0.3423**	**2.5100e-003**	**0.3448**	**0.0922**	**2.3300e-003**	**0.0945**	**0.0000**	**417.4302**	**417.4302**	**0.0192**	**0.0000**	**417.9100**

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1928	1.7611	2.1179	3.5300e-003		0.0803	0.0803		0.0756	0.0756	0.0000	303.7220	303.7220	0.0718	0.0000	305.5175
Total	**0.1928**	**1.7611**	**2.1179**	**3.5300e-003**		**0.0803**	**0.0803**		**0.0756**	**0.0756**	**0.0000**	**303.7220**	**303.7220**	**0.0718**	**0.0000**	**305.5175**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0168	0.5947	0.2083	2.0600e-003	0.0561	7.2000e-004	0.0568	0.0162	6.9000e-004	0.0169	0.0000	204.7958	204.7958	0.0154	0.0000	205.1801
Worker	0.0816	0.0481	0.6048	2.3500e-003	0.2862	1.7900e-003	0.2880	0.0760	1.6400e-003	0.0776	0.0000	212.6344	212.6344	3.8200e-003	0.0000	212.7299
Total	**0.0984**	**0.6428**	**0.8132**	**4.4100e-003**	**0.3423**	**2.5100e-003**	**0.3448**	**0.0922**	**2.3300e-003**	**0.0945**	**0.0000**	**417.4302**	**417.4302**	**0.0192**	**0.0000**	**417.9100**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0163	0.5846	0.2050	2.0400e-003	0.0559	7.0000e-004	0.0566	0.0161	6.7000e-004	0.0168	0.0000	202.7641	202.7641	0.0151	0.0000	203.1417
Worker	0.0777	0.0439	0.5622	2.2500e-003	0.2851	1.7600e-003	0.2869	0.0757	1.6200e-003	0.0773	0.0000	203.2651	203.2651	3.4800e-003	0.0000	203.3521
Total	**0.0940**	**0.6286**	**0.7672**	**4.2900e-003**	**0.3410**	**2.4600e-003**	**0.3434**	**0.0918**	**2.2900e-003**	**0.0941**	**0.0000**	**406.0292**	**406.0292**	**0.0186**	**0.0000**	**406.4938**

3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0163	0.5846	0.2050	2.0400e-003	0.0559	7.0000e-004	0.0566	0.0161	6.7000e-004	0.0168	0.0000	202.7641	202.7641	0.0151	0.0000	203.1417
Worker	0.0777	0.0439	0.5622	2.2500e-003	0.2851	1.7600e-003	0.2869	0.0757	1.6200e-003	0.0773	0.0000	203.2651	203.2651	3.4800e-003	0.0000	203.3521
Total	**0.0940**	**0.6286**	**0.7672**	**4.2900e-003**	**0.3410**	**2.4600e-003**	**0.3434**	**0.0918**	**2.2900e-003**	**0.0941**	**0.0000**	**406.0292**	**406.0292**	**0.0186**	**0.0000**	**406.4938**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0159	0.5768	0.2033	2.0200e-003	0.0559	6.8000e-004	0.0566	0.0161	6.5000e-004	0.0168	0.0000	201.5641	201.5641	0.0149	0.0000	201.9365
Worker	0.0747	0.0406	0.5276	2.1600e-003	0.2851	1.7100e-003	0.2868	0.0757	1.5700e-003	0.0773	0.0000	195.9165	195.9165	3.2000e-003	0.0000	195.9964
Total	**0.0906**	**0.6174**	**0.7309**	**4.1800e-003**	**0.3410**	**2.3900e-003**	**0.3434**	**0.0918**	**2.2200e-003**	**0.0940**	**0.0000**	**397.4806**	**397.4806**	**0.0181**	**0.0000**	**397.9329**

3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0159	0.5768	0.2033	2.0200e-003	0.0559	6.8000e-004	0.0566	0.0161	6.5000e-004	0.0168	0.0000	201.5641	201.5641	0.0149	0.0000	201.9365
Worker	0.0747	0.0406	0.5276	2.1600e-003	0.2851	1.7100e-003	0.2868	0.0757	1.5700e-003	0.0773	0.0000	195.9165	195.9165	3.2000e-003	0.0000	195.9964
Total	**0.0906**	**0.6174**	**0.7309**	**4.1800e-003**	**0.3410**	**2.3900e-003**	**0.3434**	**0.0918**	**2.2200e-003**	**0.0940**	**0.0000**	**397.4806**	**397.4806**	**0.0181**	**0.0000**	**397.9329**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0156	0.5694	0.2019	2.0100e-003	0.0559	6.7000e-004	0.0565	0.0161	6.4000e-004	0.0168	0.0000	200.4574	200.4574	0.0147	0.0000	200.8250
Worker	0.0716	0.0376	0.4974	2.0900e-003	0.2851	1.6100e-003	0.2867	0.0757	1.4800e-003	0.0772	0.0000	189.5202	189.5202	2.9500e-003	0.0000	189.5939
Total	**0.0872**	**0.6070**	**0.6993**	**4.1000e-003**	**0.3410**	**2.2800e-003**	**0.3432**	**0.0918**	**2.1200e-003**	**0.0940**	**0.0000**	**389.9776**	**389.9776**	**0.0177**	**0.0000**	**390.4189**

3.4 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0156	0.5694	0.2019	2.0100e-003	0.0559	6.7000e-004	0.0565	0.0161	6.4000e-004	0.0168	0.0000	200.4574	200.4574	0.0147	0.0000	200.8250
Worker	0.0716	0.0376	0.4974	2.0900e-003	0.2851	1.6100e-003	0.2867	0.0757	1.4800e-003	0.0772	0.0000	189.5202	189.5202	2.9500e-003	0.0000	189.5939
Total	**0.0872**	**0.6070**	**0.6993**	**4.1000e-003**	**0.3410**	**2.2800e-003**	**0.3432**	**0.0918**	**2.1200e-003**	**0.0940**	**0.0000**	**389.9776**	**389.9776**	**0.0177**	**0.0000**	**390.4189**

3.4 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4953	301.4953	0.0709	0.0000	303.2671
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4953**	**301.4953**	**0.0709**	**0.0000**	**303.2671**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0153	0.5610	0.2004	1.9900e-003	0.0557	6.5000e-004	0.0563	0.0161	6.2000e-004	0.0167	0.0000	198.7330	198.7330	0.0145	0.0000	199.0947
Worker	0.0682	0.0348	0.4688	2.0200e-003	0.2840	1.4800e-003	0.2855	0.0754	1.3700e-003	0.0768	0.0000	183.2563	183.2563	2.7200e-003	0.0000	183.3243
Total	**0.0834**	**0.5958**	**0.6692**	**4.0100e-003**	**0.3397**	**2.1300e-003**	**0.3418**	**0.0915**	**1.9900e-003**	**0.0935**	**0.0000**	**381.9893**	**381.9893**	**0.0172**	**0.0000**	**382.4190**

3.4 Building Construction - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4949	301.4949	0.0709	0.0000	303.2667
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4949**	**301.4949**	**0.0709**	**0.0000**	**303.2667**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0153	0.5610	0.2004	1.9900e-003	0.0557	6.5000e-004	0.0563	0.0161	6.2000e-004	0.0167	0.0000	198.7330	198.7330	0.0145	0.0000	199.0947
Worker	0.0682	0.0348	0.4688	2.0200e-003	0.2840	1.4800e-003	0.2855	0.0754	1.3700e-003	0.0768	0.0000	183.2563	183.2563	2.7200e-003	0.0000	183.3243
Total	**0.0834**	**0.5958**	**0.6692**	**4.0100e-003**	**0.3397**	**2.1300e-003**	**0.3418**	**0.0915**	**1.9900e-003**	**0.0935**	**0.0000**	**381.9893**	**381.9893**	**0.0172**	**0.0000**	**382.4190**

3.4 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0151	0.5573	0.2004	1.9900e-003	0.0559	6.4000e-004	0.0565	0.0161	6.1000e-004	0.0167	0.0000	198.6293	198.6293	0.0144	0.0000	198.9886
Worker	0.0649	0.0325	0.4453	1.9800e-003	0.2851	1.3800e-003	0.2865	0.0757	1.2700e-003	0.0770	0.0000	179.1069	179.1069	2.5300e-003	0.0000	179.1701
Total	**0.0800**	**0.5897**	**0.6457**	**3.9700e-003**	**0.3410**	**2.0200e-003**	**0.3430**	**0.0918**	**1.8800e-003**	**0.0937**	**0.0000**	**377.7363**	**377.7363**	**0.0169**	**0.0000**	**378.1587**

3.4 Building Construction - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0151	0.5573	0.2004	1.9900e-003	0.0559	6.4000e-004	0.0565	0.0161	6.1000e-004	0.0167	0.0000	198.6293	198.6293	0.0144	0.0000	198.9886
Worker	0.0649	0.0325	0.4453	1.9800e-003	0.2851	1.3800e-003	0.2865	0.0757	1.2700e-003	0.0770	0.0000	179.1069	179.1069	2.5300e-003	0.0000	179.1701
Total	**0.0800**	**0.5897**	**0.6457**	**3.9700e-003**	**0.3410**	**2.0200e-003**	**0.3430**	**0.0918**	**1.8800e-003**	**0.0937**	**0.0000**	**377.7363**	**377.7363**	**0.0169**	**0.0000**	**378.1587**

3.4 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0336	343.0336	0.0138	0.0000	343.3777
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0336**	**343.0336**	**0.0138**	**0.0000**	**343.3777**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0148	0.5518	0.1997	1.9800e-003	0.0559	6.3000e-004	0.0565	0.0161	6.0000e-004	0.0167	0.0000	197.8464	197.8464	0.0142	0.0000	198.2022
Worker	0.0612	0.0302	0.4219	1.9300e-003	0.2851	1.2800e-003	0.2864	0.0757	1.1800e-003	0.0769	0.0000	174.8632	174.8632	2.3400e-003	0.0000	174.9216
Total	**0.0760**	**0.5820**	**0.6215**	**3.9100e-003**	**0.3410**	**1.9100e-003**	**0.3429**	**0.0918**	**1.7800e-003**	**0.0936**	**0.0000**	**372.7096**	**372.7096**	**0.0166**	**0.0000**	**373.1238**

3.4 Building Construction - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0332	343.0332	0.0138	0.0000	343.3773
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0332**	**343.0332**	**0.0138**	**0.0000**	**343.3773**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0148	0.5518	0.1997	1.9800e-003	0.0559	6.3000e-004	0.0565	0.0161	6.0000e-004	0.0167	0.0000	197.8464	197.8464	0.0142	0.0000	198.2022
Worker	0.0612	0.0302	0.4219	1.9300e-003	0.2851	1.2800e-003	0.2864	0.0757	1.1800e-003	0.0769	0.0000	174.8632	174.8632	2.3400e-003	0.0000	174.9216
Total	**0.0760**	**0.5820**	**0.6215**	**3.9100e-003**	**0.3410**	**1.9100e-003**	**0.3429**	**0.0918**	**1.7800e-003**	**0.0936**	**0.0000**	**372.7096**	**372.7096**	**0.0166**	**0.0000**	**373.1238**

3.4 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0336	343.0336	0.0138	0.0000	343.3777
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0336**	**343.0336**	**0.0138**	**0.0000**	**343.3777**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0147	0.5456	0.1994	1.9700e-003	0.0559	6.2000e-004	0.0565	0.0161	5.9000e-004	0.0167	0.0000	197.2386	197.2386	0.0141	0.0000	197.5918
Worker	0.0571	0.0280	0.3995	1.8800e-003	0.2851	1.1900e-003	0.2863	0.0757	1.1000e-003	0.0768	0.0000	170.7511	170.7511	2.1500e-003	0.0000	170.8049
Total	**0.0717**	**0.5736**	**0.5989**	**3.8500e-003**	**0.3410**	**1.8100e-003**	**0.3428**	**0.0918**	**1.6900e-003**	**0.0935**	**0.0000**	**367.9897**	**367.9897**	**0.0163**	**0.0000**	**368.3967**

3.4 Building Construction - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1708	1.0355	2.1085	4.0400e-003		0.0193	0.0193		0.0193	0.0193	0.0000	343.0332	343.0332	0.0138	0.0000	343.3773
Total	**0.1708**	**1.0355**	**2.1085**	**4.0400e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**343.0332**	**343.0332**	**0.0138**	**0.0000**	**343.3773**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0147	0.5456	0.1994	1.9700e-003	0.0559	6.2000e-004	0.0565	0.0161	5.9000e-004	0.0167	0.0000	197.2386	197.2386	0.0141	0.0000	197.5918
Worker	0.0571	0.0280	0.3995	1.8800e-003	0.2851	1.1900e-003	0.2863	0.0757	1.1000e-003	0.0768	0.0000	170.7511	170.7511	2.1500e-003	0.0000	170.8049
Total	**0.0717**	**0.5736**	**0.5989**	**3.8500e-003**	**0.3410**	**1.8100e-003**	**0.3428**	**0.0918**	**1.6900e-003**	**0.0935**	**0.0000**	**367.9897**	**367.9897**	**0.0163**	**0.0000**	**368.3967**

3.4 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1715	1.0394	2.1166	4.0600e-003		0.0194	0.0194		0.0194	0.0194	0.0000	344.3479	344.3479	0.0138	0.0000	344.6933
Total	**0.1715**	**1.0394**	**2.1166**	**4.0600e-003**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0.0000**	**344.3479**	**344.3479**	**0.0138**	**0.0000**	**344.6933**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0146	0.5430	0.2001	1.9800e-003	0.0561	6.1000e-004	0.0567	0.0162	5.9000e-004	0.0168	0.0000	197.4619	197.4619	0.0141	0.0000	197.8141
Worker	0.0536	0.0262	0.3809	1.8600e-003	0.2862	1.1200e-003	0.2873	0.0760	1.0300e-003	0.0770	0.0000	168.1871	168.1871	2.0100e-003	0.0000	168.2373
Total	**0.0681**	**0.5692**	**0.5810**	**3.8400e-003**	**0.3423**	**1.7300e-003**	**0.3440**	**0.0922**	**1.6200e-003**	**0.0938**	**0.0000**	**365.6490**	**365.6490**	**0.0161**	**0.0000**	**366.0514**

3.4 Building Construction - 2032

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1715	1.0394	2.1166	4.0600e-003		0.0194	0.0194		0.0194	0.0194	0.0000	344.3475	344.3475	0.0138	0.0000	344.6929
Total	**0.1715**	**1.0394**	**2.1166**	**4.0600e-003**		**0.0194**	**0.0194**		**0.0194**	**0.0194**	**0.0000**	**344.3475**	**344.3475**	**0.0138**	**0.0000**	**344.6929**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0146	0.5430	0.2001	1.9800e-003	0.0561	6.1000e-004	0.0567	0.0162	5.9000e-004	0.0168	0.0000	197.4619	197.4619	0.0141	0.0000	197.8141
Worker	0.0536	0.0262	0.3809	1.8600e-003	0.2862	1.1200e-003	0.2873	0.0760	1.0300e-003	0.0770	0.0000	168.1871	168.1871	2.0100e-003	0.0000	168.2373
Total	**0.0681**	**0.5692**	**0.5810**	**3.8400e-003**	**0.3423**	**1.7300e-003**	**0.3440**	**0.0922**	**1.6200e-003**	**0.0938**	**0.0000**	**365.6490**	**365.6490**	**0.0161**	**0.0000**	**366.0514**

3.4 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0143	0.5345	0.1987	1.9600e-003	0.0557	6.0000e-004	0.0563	0.0161	5.7000e-004	0.0166	0.0000	195.5022	195.5022	0.0139	0.0000	195.8496
Worker	0.0500	0.0244	0.3607	1.8100e-003	0.2840	1.0400e-003	0.2850	0.0754	9.6000e-004	0.0764	0.0000	164.1519	164.1519	1.8600e-003	0.0000	164.1984
Total	**0.0644**	**0.5589**	**0.5593**	**3.7700e-003**	**0.3397**	**1.6400e-003**	**0.3413**	**0.0915**	**1.5300e-003**	**0.0930**	**0.0000**	**359.6541**	**359.6541**	**0.0158**	**0.0000**	**360.0481**

3.4 Building Construction - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0143	0.5345	0.1987	1.9600e-003	0.0557	6.0000e-004	0.0563	0.0161	5.7000e-004	0.0166	0.0000	195.5022	195.5022	0.0139	0.0000	195.8496
Worker	0.0500	0.0244	0.3607	1.8100e-003	0.2840	1.0400e-003	0.2850	0.0754	9.6000e-004	0.0764	0.0000	164.1519	164.1519	1.8600e-003	0.0000	164.1984
Total	**0.0644**	**0.5589**	**0.5593**	**3.7700e-003**	**0.3397**	**1.6400e-003**	**0.3413**	**0.0915**	**1.5300e-003**	**0.0930**	**0.0000**	**359.6541**	**359.6541**	**0.0158**	**0.0000**	**360.0481**

3.4 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7193	341.7193	0.0137	0.0000	342.0621
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7193**	**341.7193**	**0.0137**	**0.0000**	**342.0621**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5304	0.1985	1.9500e-003	0.0557	5.9000e-004	0.0562	0.0161	5.6000e-004	0.0166	0.0000	195.1294	195.1294	0.0138	0.0000	195.4750
Worker	0.0474	0.0231	0.3442	1.7900e-003	0.2840	9.7000e-004	0.2850	0.0754	9.0000e-004	0.0763	0.0000	161.7806	161.7806	1.7400e-003	0.0000	161.8240
Total	**0.0616**	**0.5535**	**0.5427**	**3.7400e-003**	**0.3397**	**1.5600e-003**	**0.3412**	**0.0915**	**1.4600e-003**	**0.0929**	**0.0000**	**356.9099**	**356.9099**	**0.0156**	**0.0000**	**357.2990**

3.4 Building Construction - 2034

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1702	1.0315	2.1004	4.0200e-003		0.0193	0.0193		0.0193	0.0193	0.0000	341.7189	341.7189	0.0137	0.0000	342.0617
Total	**0.1702**	**1.0315**	**2.1004**	**4.0200e-003**		**0.0193**	**0.0193**		**0.0193**	**0.0193**	**0.0000**	**341.7189**	**341.7189**	**0.0137**	**0.0000**	**342.0617**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5304	0.1985	1.9500e-003	0.0557	5.9000e-004	0.0562	0.0161	5.6000e-004	0.0166	0.0000	195.1294	195.1294	0.0138	0.0000	195.4750
Worker	0.0474	0.0231	0.3442	1.7900e-003	0.2840	9.7000e-004	0.2850	0.0754	9.0000e-004	0.0763	0.0000	161.7806	161.7806	1.7400e-003	0.0000	161.8240
Total	**0.0616**	**0.5535**	**0.5427**	**3.7400e-003**	**0.3397**	**1.5600e-003**	**0.3412**	**0.0915**	**1.4600e-003**	**0.0929**	**0.0000**	**356.9099**	**356.9099**	**0.0156**	**0.0000**	**357.2990**

3.4 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0336	343.0336	0.0128	0.0000	343.3530
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0336**	**343.0336**	**0.0128**	**0.0000**	**343.3530**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5291	0.1990	1.9500e-003	0.0559	5.8000e-004	0.0565	0.0161	5.6000e-004	0.0167	0.0000	195.5829	195.5829	0.0138	0.0000	195.9282
Worker	0.0453	0.0221	0.3316	1.7700e-003	0.2851	9.2000e-004	0.2860	0.0757	8.5000e-004	0.0766	0.0000	160.3861	160.3861	1.6400e-003	0.0000	160.4272
Total	**0.0595**	**0.5512**	**0.5307**	**3.7200e-003**	**0.3410**	**1.5000e-003**	**0.3425**	**0.0918**	**1.4100e-003**	**0.0932**	**0.0000**	**355.9690**	**355.9690**	**0.0155**	**0.0000**	**356.3553**

3.4 Building Construction - 2035

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0332	343.0332	0.0128	0.0000	343.3526
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0332**	**343.0332**	**0.0128**	**0.0000**	**343.3526**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5291	0.1990	1.9500e-003	0.0559	5.8000e-004	0.0565	0.0161	5.6000e-004	0.0167	0.0000	195.5829	195.5829	0.0138	0.0000	195.9282
Worker	0.0453	0.0221	0.3316	1.7700e-003	0.2851	9.2000e-004	0.2860	0.0757	8.5000e-004	0.0766	0.0000	160.3861	160.3861	1.6400e-003	0.0000	160.4272
Total	**0.0595**	**0.5512**	**0.5307**	**3.7200e-003**	**0.3410**	**1.5000e-003**	**0.3425**	**0.0918**	**1.4100e-003**	**0.0932**	**0.0000**	**355.9690**	**355.9690**	**0.0155**	**0.0000**	**356.3553**

3.4 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1594	0.9381	2.1114	4.0600e-003		0.0118	0.0118		0.0118	0.0118	0.0000	344.3479	344.3479	0.0128	0.0000	344.6686
Total	**0.1594**	**0.9381**	**2.1114**	**4.0600e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**344.3479**	**344.3479**	**0.0128**	**0.0000**	**344.6686**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5311	0.1998	1.9600e-003	0.0561	5.9000e-004	0.0567	0.0162	5.6000e-004	0.0167	0.0000	196.3323	196.3323	0.0139	0.0000	196.6789
Worker	0.0455	0.0222	0.3329	1.7800e-003	0.2862	9.2000e-004	0.2871	0.0760	8.5000e-004	0.0769	0.0000	161.0006	161.0006	1.6500e-003	0.0000	161.0418
Total	**0.0597**	**0.5533**	**0.5327**	**3.7400e-003**	**0.3423**	**1.5100e-003**	**0.3438**	**0.0922**	**1.4100e-003**	**0.0936**	**0.0000**	**357.3329**	**357.3329**	**0.0155**	**0.0000**	**357.7207**

3.4 Building Construction - 2036

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1594	0.9381	2.1114	4.0600e-003		0.0118	0.0118		0.0118	0.0118	0.0000	344.3475	344.3475	0.0128	0.0000	344.6682
Total	**0.1594**	**0.9381**	**2.1114**	**4.0600e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**344.3475**	**344.3475**	**0.0128**	**0.0000**	**344.6682**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5311	0.1998	1.9600e-003	0.0561	5.9000e-004	0.0567	0.0162	5.6000e-004	0.0167	0.0000	196.3323	196.3323	0.0139	0.0000	196.6789
Worker	0.0455	0.0222	0.3329	1.7800e-003	0.2862	9.2000e-004	0.2871	0.0760	8.5000e-004	0.0769	0.0000	161.0006	161.0006	1.6500e-003	0.0000	161.0418
Total	**0.0597**	**0.5533**	**0.5327**	**3.7400e-003**	**0.3423**	**1.5100e-003**	**0.3438**	**0.0922**	**1.4100e-003**	**0.0936**	**0.0000**	**357.3329**	**357.3329**	**0.0155**	**0.0000**	**357.7207**

3.4 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0336	343.0336	0.0128	0.0000	343.3530
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0336**	**343.0336**	**0.0128**	**0.0000**	**343.3530**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5291	0.1990	1.9500e-003	0.0559	5.8000e-004	0.0565	0.0161	5.6000e-004	0.0167	0.0000	195.5829	195.5829	0.0138	0.0000	195.9282
Worker	0.0453	0.0221	0.3316	1.7700e-003	0.2851	9.2000e-004	0.2860	0.0757	8.5000e-004	0.0766	0.0000	160.3861	160.3861	1.6400e-003	0.0000	160.4272
Total	**0.0595**	**0.5512**	**0.5307**	**3.7200e-003**	**0.3410**	**1.5000e-003**	**0.3425**	**0.0918**	**1.4100e-003**	**0.0932**	**0.0000**	**355.9690**	**355.9690**	**0.0155**	**0.0000**	**356.3553**

3.4 Building Construction - 2037

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1588	0.9346	2.1034	4.0400e-003		0.0118	0.0118		0.0118	0.0118	0.0000	343.0332	343.0332	0.0128	0.0000	343.3526
Total	**0.1588**	**0.9346**	**2.1034**	**4.0400e-003**		**0.0118**	**0.0118**		**0.0118**	**0.0118**	**0.0000**	**343.0332**	**343.0332**	**0.0128**	**0.0000**	**343.3526**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.5291	0.1990	1.9500e-003	0.0559	5.8000e-004	0.0565	0.0161	5.6000e-004	0.0167	0.0000	195.5829	195.5829	0.0138	0.0000	195.9282
Worker	0.0453	0.0221	0.3316	1.7700e-003	0.2851	9.2000e-004	0.2860	0.0757	8.5000e-004	0.0766	0.0000	160.3861	160.3861	1.6400e-003	0.0000	160.4272
Total	**0.0595**	**0.5512**	**0.5307**	**3.7200e-003**	**0.3410**	**1.5000e-003**	**0.3425**	**0.0918**	**1.4100e-003**	**0.0932**	**0.0000**	**355.9690**	**355.9690**	**0.0155**	**0.0000**	**356.3553**

3.4 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0657	0.3867	0.8704	1.6700e-003		4.8800e-003	4.8800e-003		4.8800e-003	4.8800e-003	0.0000	141.9450	141.9450	5.2900e-003	0.0000	142.0771
Total	**0.0657**	**0.3867**	**0.8704**	**1.6700e-003**		**4.8800e-003**	**4.8800e-003**		**4.8800e-003**	**4.8800e-003**	**0.0000**	**141.9450**	**141.9450**	**5.2900e-003**	**0.0000**	**142.0771**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.8600e-003	0.2189	0.0824	8.1000e-004	0.0231	2.4000e-004	0.0234	6.6700e-003	2.3000e-004	6.9000e-003	0.0000	80.9309	80.9309	5.7100e-003	0.0000	81.0737
Worker	0.0188	9.1600e-003	0.1372	7.3000e-004	0.1180	3.8000e-004	0.1184	0.0313	3.5000e-004	0.0317	0.0000	66.3667	66.3667	6.8000e-004	0.0000	66.3837
Total	**0.0246**	**0.2281**	**0.2196**	**1.5400e-003**	**0.1411**	**6.2000e-004**	**0.1417**	**0.0380**	**5.8000e-004**	**0.0386**	**0.0000**	**147.2975**	**147.2975**	**6.3900e-003**	**0.0000**	**147.4574**

3.4 Building Construction - 2038

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0657	0.3867	0.8704	1.6700e-003		4.8800e-003	4.8800e-003		4.8800e-003	4.8800e-003	0.0000	141.9448	141.9448	5.2900e-003	0.0000	142.0770
Total	**0.0657**	**0.3867**	**0.8704**	**1.6700e-003**		**4.8800e-003**	**4.8800e-003**		**4.8800e-003**	**4.8800e-003**	**0.0000**	**141.9448**	**141.9448**	**5.2900e-003**	**0.0000**	**142.0770**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.8600e-003	0.2189	0.0824	8.1000e-004	0.0231	2.4000e-004	0.0234	6.6700e-003	2.3000e-004	6.9000e-003	0.0000	80.9309	80.9309	5.7100e-003	0.0000	81.0737
Worker	0.0188	9.1600e-003	0.1372	7.3000e-004	0.1180	3.8000e-004	0.1184	0.0313	3.5000e-004	0.0317	0.0000	66.3667	66.3667	6.8000e-004	0.0000	66.3837
Total	**0.0246**	**0.2281**	**0.2196**	**1.5400e-003**	**0.1411**	**6.2000e-004**	**0.1417**	**0.0380**	**5.8000e-004**	**0.0386**	**0.0000**	**147.2975**	**147.2975**	**6.3900e-003**	**0.0000**	**147.4574**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0838	0.8455	1.1081	1.7300e-003		0.0432	0.0432		0.0397	0.0397	0.0000	152.2094	152.2094	0.0492	0.0000	153.4401
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0838**	**0.8455**	**1.1081**	**1.7300e-003**		**0.0432**	**0.0432**		**0.0397**	**0.0397**	**0.0000**	**152.2094**	**152.2094**	**0.0492**	**0.0000**	**153.4401**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9500e-003	2.5400e-003	0.0305	1.1000e-004	0.0125	8.0000e-005	0.0126	3.3200e-003	7.0000e-005	3.4000e-003	0.0000	10.0689	10.0689	2.0000e-004	0.0000	10.0739
Total	**3.9500e-003**	**2.5400e-003**	**0.0305**	**1.1000e-004**	**0.0125**	**8.0000e-005**	**0.0126**	**3.3200e-003**	**7.0000e-005**	**3.4000e-003**	**0.0000**	**10.0689**	**10.0689**	**2.0000e-004**	**0.0000**	**10.0739**

3.5 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0838	0.8455	1.1081	1.7300e-003		0.0432	0.0432		0.0397	0.0397	0.0000	152.2093	152.2093	0.0492	0.0000	153.4399
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0838**	**0.8455**	**1.1081**	**1.7300e-003**		**0.0432**	**0.0432**		**0.0397**	**0.0397**	**0.0000**	**152.2093**	**152.2093**	**0.0492**	**0.0000**	**153.4399**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9500e-003	2.5400e-003	0.0305	1.1000e-004	0.0125	8.0000e-005	0.0126	3.3200e-003	7.0000e-005	3.4000e-003	0.0000	10.0689	10.0689	2.0000e-004	0.0000	10.0739
Total	**3.9500e-003**	**2.5400e-003**	**0.0305**	**1.1000e-004**	**0.0125**	**8.0000e-005**	**0.0126**	**3.3200e-003**	**7.0000e-005**	**3.4000e-003**	**0.0000**	**10.0689**	**10.0689**	**2.0000e-004**	**0.0000**	**10.0739**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0563	0.5554	0.7948	1.2400e-003		0.0278	0.0278		0.0256	0.0256	0.0000	109.1464	109.1464	0.0353	0.0000	110.0289
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0563**	**0.5554**	**0.7948**	**1.2400e-003**		**0.0278**	**0.0278**		**0.0256**	**0.0256**	**0.0000**	**109.1464**	**109.1464**	**0.0353**	**0.0000**	**110.0289**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6900e-003	1.6600e-003	0.0204	8.0000e-005	8.9700e-003	6.0000e-005	9.0300e-003	2.3800e-003	5.0000e-005	2.4400e-003	0.0000	6.9431	6.9431	1.3000e-004	0.0000	6.9464
Total	**2.6900e-003**	**1.6600e-003**	**0.0204**	**8.0000e-005**	**8.9700e-003**	**6.0000e-005**	**9.0300e-003**	**2.3800e-003**	**5.0000e-005**	**2.4400e-003**	**0.0000**	**6.9431**	**6.9431**	**1.3000e-004**	**0.0000**	**6.9464**

3.5 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0563	0.5554	0.7948	1.2400e-003		0.0278	0.0278		0.0256	0.0256	0.0000	109.1463	109.1463	0.0353	0.0000	110.0288
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0563**	**0.5554**	**0.7948**	**1.2400e-003**		**0.0278**	**0.0278**		**0.0256**	**0.0256**	**0.0000**	**109.1463**	**109.1463**	**0.0353**	**0.0000**	**110.0288**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6900e-003	1.6600e-003	0.0204	8.0000e-005	8.9700e-003	6.0000e-005	9.0300e-003	2.3800e-003	5.0000e-005	2.4400e-003	0.0000	6.9431	6.9431	1.3000e-004	0.0000	6.9464
Total	**2.6900e-003**	**1.6600e-003**	**0.0204**	**8.0000e-005**	**8.9700e-003**	**6.0000e-005**	**9.0300e-003**	**2.3800e-003**	**5.0000e-005**	**2.4400e-003**	**0.0000**	**6.9431**	**6.9431**	**1.3000e-004**	**0.0000**	**6.9464**

3.6 Architectural Coating - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	65.7013					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0200e-003	0.0580	0.1373	2.3000e-004		7.6000e-004	7.6000e-004		7.6000e-004	7.6000e-004	0.0000	19.5324	19.5324	7.2000e-004	0.0000	19.5504
Total	**65.7103**	**0.0580**	**0.1373**	**2.3000e-004**		**7.6000e-004**	**7.6000e-004**		**7.6000e-004**	**7.6000e-004**	**0.0000**	**19.5324**	**19.5324**	**7.2000e-004**	**0.0000**	**19.5504**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0266	0.0130	0.1944	1.0400e-003	0.1671	5.4000e-004	0.1677	0.0444	5.0000e-004	0.0449	0.0000	94.0195	94.0195	9.6000e-004	0.0000	94.0435
Total	**0.0266**	**0.0130**	**0.1944**	**1.0400e-003**	**0.1671**	**5.4000e-004**	**0.1677**	**0.0444**	**5.0000e-004**	**0.0449**	**0.0000**	**94.0195**	**94.0195**	**9.6000e-004**	**0.0000**	**94.0435**

3.6 Architectural Coating - 2038

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	65.7013					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0200e-003	0.0580	0.1373	2.3000e-004		7.6000e-004	7.6000e-004		7.6000e-004	7.6000e-004	0.0000	19.5324	19.5324	7.2000e-004	0.0000	19.5504
Total	**65.7103**	**0.0580**	**0.1373**	**2.3000e-004**		**7.6000e-004**	**7.6000e-004**		**7.6000e-004**	**7.6000e-004**	**0.0000**	**19.5324**	**19.5324**	**7.2000e-004**	**0.0000**	**19.5504**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0266	0.0130	0.1944	1.0400e-003	0.1671	5.4000e-004	0.1677	0.0444	5.0000e-004	0.0449	0.0000	94.0195	94.0195	9.6000e-004	0.0000	94.0435
Total	**0.0266**	**0.0130**	**0.1944**	**1.0400e-003**	**0.1671**	**5.4000e-004**	**0.1677**	**0.0444**	**5.0000e-004**	**0.0449**	**0.0000**	**94.0195**	**94.0195**	**9.6000e-004**	**0.0000**	**94.0435**

3.6 Architectural Coating - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	111.6492					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.0985	0.2333	3.9000e-004		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	33.1923	33.1923	1.2300e-003	0.0000	33.2230
Total	**111.6645**	**0.0985**	**0.2333**	**3.9000e-004**		**1.2900e-003**	**1.2900e-003**		**1.2900e-003**	**1.2900e-003**	**0.0000**	**33.1923**	**33.1923**	**1.2300e-003**	**0.0000**	**33.2230**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0451	0.0220	0.3304	1.7600e-003	0.2840	9.2000e-004	0.2849	0.0754	8.4000e-004	0.0763	0.0000	159.7716	159.7716	1.6400e-003	0.0000	159.8125
Total	**0.0451**	**0.0220**	**0.3304**	**1.7600e-003**	**0.2840**	**9.2000e-004**	**0.2849**	**0.0754**	**8.4000e-004**	**0.0763**	**0.0000**	**159.7716**	**159.7716**	**1.6400e-003**	**0.0000**	**159.8125**

3.6 Architectural Coating - 2039

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	111.6492					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0153	0.0985	0.2333	3.9000e-004		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	33.1923	33.1923	1.2300e-003	0.0000	33.2229
Total	**111.6645**	**0.0985**	**0.2333**	**3.9000e-004**		**1.2900e-003**	**1.2900e-003**		**1.2900e-003**	**1.2900e-003**	**0.0000**	**33.1923**	**33.1923**	**1.2300e-003**	**0.0000**	**33.2229**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0451	0.0220	0.3304	1.7600e-003	0.2840	9.2000e-004	0.2849	0.0754	8.4000e-004	0.0763	0.0000	159.7716	159.7716	1.6400e-003	0.0000	159.8125
Total	**0.0451**	**0.0220**	**0.3304**	**1.7600e-003**	**0.2840**	**9.2000e-004**	**0.2849**	**0.0754**	**8.4000e-004**	**0.0763**	**0.0000**	**159.7716**	**159.7716**	**1.6400e-003**	**0.0000**	**159.8125**

3.6 Architectural Coating - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	112.0786					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0150	0.0949	0.2339	3.9000e-004		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	33.3200	33.3200	1.1700e-003	0.0000	33.3493
Total	**112.0936**	**0.0949**	**0.2339**	**3.9000e-004**		**9.7000e-004**	**9.7000e-004**		**9.7000e-004**	**9.7000e-004**	**0.0000**	**33.3200**	**33.3200**	**1.1700e-003**	**0.0000**	**33.3493**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0371	0.0189	0.2886	1.7000e-003	0.2851	7.2000e-004	0.2858	0.0757	6.7000e-004	0.0764	0.0000	154.3459	154.3459	1.3300e-003	0.0000	154.3792
Total	**0.0371**	**0.0189**	**0.2886**	**1.7000e-003**	**0.2851**	**7.2000e-004**	**0.2858**	**0.0757**	**6.7000e-004**	**0.0764**	**0.0000**	**154.3459**	**154.3459**	**1.3300e-003**	**0.0000**	**154.3792**

3.6 Architectural Coating - 2040

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	112.0786					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0150	0.0949	0.2339	3.9000e-004		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	33.3199	33.3199	1.1700e-003	0.0000	33.3492
Total	**112.0936**	**0.0949**	**0.2339**	**3.9000e-004**		**9.7000e-004**	**9.7000e-004**		**9.7000e-004**	**9.7000e-004**	**0.0000**	**33.3199**	**33.3199**	**1.1700e-003**	**0.0000**	**33.3492**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0371	0.0189	0.2886	1.7000e-003	0.2851	7.2000e-004	0.2858	0.0757	6.7000e-004	0.0764	0.0000	154.3459	154.3459	1.3300e-003	0.0000	154.3792
Total	**0.0371**	**0.0189**	**0.2886**	**1.7000e-003**	**0.2851**	**7.2000e-004**	**0.2858**	**0.0757**	**6.7000e-004**	**0.0764**	**0.0000**	**154.3459**	**154.3459**	**1.3300e-003**	**0.0000**	**154.3792**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	185.3680	817.3934	2,473.0015	8.8023	765.1668	8.9151	774.0819	204.9122	8.3651	213.2774	0.0000	809,930.6533	809,930.6533	34.9735	0.0000	810,804.9902
Unmitigated	185.3680	817.3934	2,473.0015	8.8023	765.1668	8.9151	774.0819	204.9122	8.3651	213.2774	0.0000	809,930.6533	809,930.6533	34.9735	0.0000	810,804.9902

4.2 Trip Summary Information

Lake Forest General Plan Buildout Year (2040) - Orange County, Annual

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	2,604.00	3,087.60	2263.00	8,967,876	8,967,876
Apartments High Rise	13,713.00	16,259.70	11917.25	47,225,991	47,225,991
Apartments High Rise	3,990.00	4,731.00	3467.50	13,741,100	13,741,100
Apartments Mid Rise	52,741.15	50,679.09	46475.66	176,159,307	176,159,307
Apartments Mid Rise	21,506.10	20,665.26	18951.24	71,831,951	71,831,951
Apartments Mid Rise	50,320.55	48,353.13	44342.62	168,074,326	168,074,326
Apartments Mid Rise	7,680.75	7,380.45	6768.30	25,654,268	25,654,268
Condo/Townhouse	55,712.09	54,369.63	46410.76	185,180,754	185,180,754
Single Family Housing	162,058.96	168,697.93	146738.26	549,541,973	549,541,973
General Office Building	1,217.71	271.58	115.92	2,980,341	2,980,341
General Office Building	5,666.28	1,263.74	539.40	13,868,169	13,868,169
Office Park	51,913.26	7,455.14	3454.82	130,549,274	130,549,274
Strip Mall	135,367.91	128,404.03	62399.96	235,824,920	235,824,920
General Light Industry	66,672.25	12,626.59	6504.61	222,990,616	222,990,616
Library	45,639.15	37,775.65	20685.31	103,388,312	103,388,312
City Park	470.61	5,664.75	4168.26	5,009,411	5,009,411
City Park	3,664.71	44,112.25	32458.86	39,009,027	39,009,027
City Park	1,657.53	19,951.75	14680.98	17,643,588	17,643,588
Total	682,596.01	631,749.29	472,342.72	2,017,641,204	2,017,641,204

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Office Park	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15
General Light Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3
Library	16.60	8.40	6.90	52.00	43.00	5.00	44	44	12
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Apartments Mid Rise	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Condo/Townhouse	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Single Family Housing	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
General Office Building	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Office Park	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Strip Mall	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
General Light Industry	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Library	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
City Park	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	154,129.8218	154,129.8218	6.3632	1.3165	154,681.2258
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	154,129.8218	154,129.8218	6.3632	1.3165	154,681.2258
NaturalGas Mitigated	6.3162	54.7996	29.0155	0.3445		4.3639	4.3639		4.3639	4.3639	0.0000	62,508.8270	62,508.8270	1.1981	1.1460	62,880.2857
NaturalGas Unmitigated	6.3162	54.7996	29.0155	0.3445		4.3639	4.3639		4.3639	4.3639	0.0000	62,508.8270	62,508.8270	1.1981	1.1460	62,880.2857

5.2 Energy by Land Use - NaturalGas

Unmitigated

Lake Forest General Plan Buildout Year (2040) - Orange County, Annual

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	3.73107e+007	0.2012	1.7192	0.7316	0.0110		0.1390	0.1390		0.1390	0.1390	0.0000	1,991.0387	1,991.0387	0.0382	0.0365	2,002.8705
Apartments High Rise	7.08503e+006	0.0382	0.3265	0.1389	2.0800e-003		0.0264	0.0264		0.0264	0.0264	0.0000	378.0839	378.0839	7.2500e-003	6.9300e-003	380.3307
Apartments High Rise	1.08561e+007	0.0585	0.5002	0.2129	3.1900e-003		0.0404	0.0404		0.0404	0.0404	0.0000	579.3221	579.3221	0.0111	0.0106	582.7648
Apartments Mid Rise	1.31987e+007	0.0712	0.6082	0.2588	3.8800e-003		0.0492	0.0492		0.0492	0.0492	0.0000	704.3338	704.3338	0.0135	0.0129	708.5193
Apartments Mid Rise	3.69564e+007	0.1993	1.7029	0.7246	0.0109		0.1377	0.1377		0.1377	0.1377	0.0000	1,972.1345	1,972.1345	0.0378	0.0362	1,983.8540
Apartments Mid Rise	8.64716e+007	0.4663	3.9845	1.6955	0.0254		0.3222	0.3222		0.3222	0.3222	0.0000	4,614.4533	4,614.4533	0.0884	0.0846	4,641.8747
Apartments Mid Rise	9.06312e+007	0.4887	4.1761	1.7771	0.0267		0.3377	0.3377		0.3377	0.3377	0.0000	4,836.4252	4,836.4252	0.0927	0.0887	4,865.1657
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.69204e+008	0.9124	7.7967	3.3177	0.0498		0.6304	0.6304		0.6304	0.6304	0.0000	9,029.3669	9,029.3669	0.1731	0.1655	9,083.0239
General Light Industry	1.99921e+008	1.0780	9.8001	8.2320	0.0588		0.7448	0.7448		0.7448	0.7448	0.0000	10,668.5503	10,668.5503	0.2045	0.1956	10,731.9481
General Office Building	1.00904e+006	5.4400e-003	0.0495	0.0416	3.0000e-004		3.7600e-003	3.7600e-003		3.7600e-003	3.7600e-003	0.0000	53.8461	53.8461	1.0300e-003	9.9000e-004	54.1661
General Office Building	4.69536e+006	0.0253	0.2302	0.1933	1.3800e-003		0.0175	0.0175		0.0175	0.0175	0.0000	250.5620	250.5620	4.8000e-003	4.5900e-003	252.0510
Library	1.69605e+007	0.0915	0.8314	0.6984	4.9900e-003		0.0632	0.0632		0.0632	0.0632	0.0000	905.0767	905.0767	0.0174	0.0166	910.4551
Office Park	5.1686e+007	0.2787	2.5336	2.1283	0.0152		0.1926	0.1926		0.1926	0.1926	0.0000	2,758.1598	2,758.1598	0.0529	0.0506	2,774.5501
Single Family Housing	4.39277e+008	2.3687	20.2412	8.6133	0.1292		1.6365	1.6365		1.6365	1.6365	0.0000	23,441.4927	23,441.4927	0.4493	0.4298	23,580.7938
Strip Mall	6.10865e+006	0.0329	0.2994	0.2515	1.8000e-003		0.0228	0.0228		0.0228	0.0228	0.0000	325.9809	325.9809	6.2500e-003	5.9800e-003	327.9181
Total		**6.3162**	**54.7996**	**29.0155**	**0.3445**		**4.3639**	**4.3639**		**4.3639**	**4.3639**	**0.0000**	**62,508.8270**	**62,508.8270**	**1.1981**	**1.1460**	**62,880.2857**

5.2 Energy by Land Use - NaturalGas

Mitigated

Lake Forest General Plan Buildout Year (2040) - Orange County, Annual

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	1.08561e+007	0.0585	0.5002	0.2129	3.1900e-003		0.0404	0.0404		0.0404	0.0404	0.0000	579.3221	579.3221	0.0111	0.0106	582.7648
Apartments High Rise	3.73107e+007	0.2012	1.7192	0.7316	0.0110		0.1390	0.1390		0.1390	0.1390	0.0000	1,991.0387	1,991.0387	0.0382	0.0365	2,002.8705
Apartments High Rise	7.08503e+006	0.0382	0.3265	0.1389	2.0800e-003		0.0264	0.0264		0.0264	0.0264	0.0000	378.0839	378.0839	7.2500e-003	6.9300e-003	380.3307
Apartments Mid Rise	1.31987e+007	0.0712	0.6082	0.2588	3.8800e-003		0.0492	0.0492		0.0492	0.0492	0.0000	704.3338	704.3338	0.0135	0.0129	708.5193
Apartments Mid Rise	3.69564e+007	0.1993	1.7029	0.7246	0.0109		0.1377	0.1377		0.1377	0.1377	0.0000	1,972.1345	1,972.1345	0.0378	0.0362	1,983.8540
Apartments Mid Rise	8.64716e+007	0.4663	3.9845	1.6955	0.0254		0.3222	0.3222		0.3222	0.3222	0.0000	4,614.4533	4,614.4533	0.0884	0.0846	4,641.8747
Apartments Mid Rise	9.06312e+007	0.4887	4.1761	1.7771	0.0267		0.3377	0.3377		0.3377	0.3377	0.0000	4,836.4252	4,836.4252	0.0927	0.0887	4,865.1657
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	1.69204e+008	0.9124	7.7967	3.3177	0.0498		0.6304	0.6304		0.6304	0.6304	0.0000	9,029.3669	9,029.3669	0.1731	0.1655	9,083.0239
General Light Industry	1.99921e+008	1.0780	9.8001	8.2320	0.0588		0.7448	0.7448		0.7448	0.7448	0.0000	10,668.5503	10,668.5503	0.2045	0.1956	10,731.9481
General Office Building	1.00904e+006	5.4400e-003	0.0495	0.0416	3.0000e-004		3.7600e-003	3.7600e-003		3.7600e-003	3.7600e-003	0.0000	53.8461	53.8461	1.0300e-003	9.9000e-004	54.1661
General Office Building	4.69536e+006	0.0253	0.2302	0.1933	1.3800e-003		0.0175	0.0175		0.0175	0.0175	0.0000	250.5620	250.5620	4.8000e-003	4.5900e-003	252.0510
Library	1.69605e+007	0.0915	0.8314	0.6984	4.9900e-003		0.0632	0.0632		0.0632	0.0632	0.0000	905.0767	905.0767	0.0174	0.0166	910.4551
Office Park	5.1686e+007	0.2787	2.5336	2.1283	0.0152		0.1926	0.1926		0.1926	0.1926	0.0000	2,758.1598	2,758.1598	0.0529	0.0506	2,774.5501
Single Family Housing	4.39277e+008	2.3687	20.2412	8.6133	0.1292		1.6365	1.6365		1.6365	1.6365	0.0000	23,441.4927	23,441.4927	0.4493	0.4298	23,580.7938
Strip Mall	6.10865e+006	0.0329	0.2994	0.2515	1.8000e-003		0.0228	0.0228		0.0228	0.0228	0.0000	325.9809	325.9809	6.2500e-003	5.9800e-003	327.9181
Total		**6.3162**	**54.7996**	**29.0155**	**0.3445**		**4.3639**	**4.3639**		**4.3639**	**4.3639**	**0.0000**	**62,508.8270**	**62,508.8270**	**1.1981**	**1.1460**	**62,880.2857**

5.3 Energy by Land Use - Electricity

Unmitigated

Lake Forest General Plan Buildout Year (2040) - Orange County, Annual

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	1.29794e+007	4,135.5004	0.1707	0.0353	4,150.2953
Apartments High Rise	2.46469e+006	785.3018	0.0324	6.7100e-003	788.1112
Apartments High Rise	3.77653e+006	1,203.2850	0.0497	0.0103	1,207.5898
Apartments Mid Rise	1.28561e+007	4,096.2353	0.1691	0.0350	4,110.8897
Apartments Mid Rise	3.00811e+007	9,584.4814	0.3957	0.0819	9,618.7701
Apartments Mid Rise	3.15281e+007	10,045.5295	0.4147	0.0858	10,081.4677
Apartments Mid Rise	4.59147e+006	1,462.9412	0.0604	0.0125	1,468.1749
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	4.76431e+007	15,180.1246	0.6267	0.1297	15,234.4319
General Light Industry	8.08293e+007	25,753.9585	1.0632	0.2200	25,846.0940
General Office Building	1.54447e+006	492.1006	0.0203	4.2000e-003	493.8611
General Office Building	7.18687e+006	2,289.8917	0.0945	0.0196	2,298.0838
Library	6.85723e+006	2,184.8617	0.0902	0.0187	2,192.6781
Office Park	6.99602e+007	22,290.8041	0.9203	0.1904	22,370.5501
Single Family Housing	1.365e+008	43,491.6990	1.7955	0.3715	43,647.2919
Strip Mall	3.49415e+007	11,133.1071	0.4596	0.0951	11,172.9362
Total		**154,129.8218**	**6.3632**	**1.3165**	**154,681.2258**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	1.29794e+007	4,135.5004	0.1707	0.0353	4,150.2953
Apartments High Rise	2.46469e+006	785.3018	0.0324	6.7100e-003	788.1112
Apartments High Rise	3.77653e+006	1,203.2850	0.0497	0.0103	1,207.5898
Apartments Mid Rise	1.28561e+007	4,096.2353	0.1691	0.0350	4,110.8897
Apartments Mid Rise	3.00811e+007	9,584.4814	0.3957	0.0819	9,618.7701
Apartments Mid Rise	3.15281e+007	10,045.5295	0.4147	0.0858	10,081.4677
Apartments Mid Rise	4.59147e+006	1,462.9412	0.0604	0.0125	1,468.1749
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	4.76431e+007	15,180.1246	0.6267	0.1297	15,234.4319
General Light Industry	8.08293e+007	25,753.9585	1.0632	0.2200	25,846.0940
General Office Building	1.54447e+006	492.1006	0.0203	4.2000e-003	493.8611
General Office Building	7.18687e+006	2,289.8917	0.0945	0.0196	2,298.0838
Library	6.85723e+006	2,184.8617	0.0902	0.0187	2,192.6781
Office Park	6.99602e+007	22,290.8041	0.9203	0.1904	22,370.5501
Single Family Housing	1.365e+008	43,491.6990	1.7955	0.3715	43,647.2919
Strip Mall	3.49415e+007	11,133.1071	0.4596	0.0951	11,172.9362
Total		**154,129.8218**	**6.3632**	**1.3165**	**154,681.2258**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	348.3199	6.1458	531.4281	0.0280		2.9216	2.9216		2.9216	2.9216	0.0000	865.2872	865.2872	0.8447	0.0000	886.4037
Unmitigated	348.3199	6.1458	531.4281	0.0280		2.9216	2.9216		2.9216	2.9216	0.0000	865.2872	865.2872	0.8447	0.0000	886.4037

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	28.9429					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	303.1769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	16.2002	6.1458	531.4281	0.0280		2.9216	2.9216		2.9216	2.9216	0.0000	865.2872	865.2872	0.8447	0.0000	886.4037
Total	**348.3199**	**6.1458**	**531.4281**	**0.0280**		**2.9216**	**2.9216**		**2.9216**	**2.9216**	**0.0000**	**865.2872**	**865.2872**	**0.8447**	**0.0000**	**886.4037**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	28.9429					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	303.1769					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	16.2002	6.1458	531.4281	0.0280		2.9216	2.9216		2.9216	2.9216	0.0000	865.2872	865.2872	0.8447	0.0000	886.4037
Total	**348.3199**	**6.1458**	**531.4281**	**0.0280**		**2.9216**	**2.9216**		**2.9216**	**2.9216**	**0.0000**	**865.2872**	**865.2872**	**0.8447**	**0.0000**	**886.4037**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	53,060.0577	221.3073	5.6109	60,264.7865
Unmitigated	53,060.0577	221.3073	5.6109	60,264.7865

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	315.02 / 198.599	2,109.9042	10.3479	0.2596	2,445.9463
Apartments Mid Rise	1295.72 / 816.866	8,678.3175	42.5623	1.0676	10,060.5035
City Park	0 / 3651.89	12,927.2683	0.5337	0.1104	12,973.5160
Condo/Townhouse	624.762 / 393.872	4,184.4615	20.5225	0.5147	4,850.9161
General Light Industry	2212.05 / 0	9,879.0448	72.4584	1.7803	12,221.0469
General Office Building	110.927 / 67.9876	736.0717	3.6435	0.0913	854.3769
Library	25.3913 / 39.7145	253.9828	0.8375	0.0216	281.3688
Office Park	807.946 / 495.192	5,361.2281	26.5377	0.6652	6,222.9114
Single Family Housing	1109.12 / 699.226	7,428.5211	36.4328	0.9138	8,611.6534
Strip Mall	226.242 / 138.664	1,501.2577	7.4311	0.1863	1,742.5473
Total		**53,060.0577**	**221.3073**	**5.6109**	**60,264.7865**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	315.02 / 198.599	2,109.9042	10.3479	0.2596	2,445.9463
Apartments Mid Rise	1295.72 / 816.866	8,678.3175	42.5623	1.0676	10,060.5035
City Park	0 / 3651.89	12,927.2683	0.5337	0.1104	12,973.5160
Condo/Townhouse	624.762 / 393.872	4,184.4615	20.5225	0.5147	4,850.9161
General Light Industry	2212.05 / 0	9,879.0448	72.4584	1.7803	12,221.0469
General Office Building	110.927 / 67.9876	736.0717	3.6435	0.0913	854.3769
Library	25.3913 / 39.7145	253.9828	0.8375	0.0216	281.3688
Office Park	807.946 / 495.192	5,361.2281	26.5377	0.6652	6,222.9114
Single Family Housing	1109.12 / 699.226	7,428.5211	36.4328	0.9138	8,611.6534
Strip Mall	226.242 / 138.664	1,501.2577	7.4311	0.1863	1,742.5473
Total		**53,060.0577**	**221.3073**	**5.6109**	**60,264.7865**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	11,651.6001	688.5898	0.0000	28,866.3460
Unmitigated	11,651.6001	688.5898	0.0000	28,866.3460

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	2224.1	451.4722	26.6812	0.0000	1,118.5033
Apartments Mid Rise	9148.02	1,856.9654	109.7435	0.0000	4,600.5532
City Park	263.59	53.5064	3.1621	0.0000	132.5598
Condo/Townhouse	4410.94	895.3810	52.9155	0.0000	2,218.2684
General Light Industry	11861.3	2,407.7448	142.2936	0.0000	5,965.0859
General Office Building	580.43	117.8220	6.9631	0.0000	291.8991
Library	747.33	151.7012	8.9653	0.0000	375.8334
Office Park	4227.61	858.1666	50.7162	0.0000	2,126.0715
Single Family Housing	20729.2	4,207.8382	248.6761	0.0000	10,424.7411
Strip Mall	3207.05	651.0022	38.4731	0.0000	1,612.8303
Total		**11,651.6001**	**688.5898**	**0.0000**	**28,866.3460**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	2224.1	451.4722	26.6812	0.0000	1,118.5033
Apartments Mid Rise	9148.02	1,856.9654	109.7435	0.0000	4,600.5532
City Park	263.59	53.5064	3.1621	0.0000	132.5598
Condo/Townhouse	4410.94	895.3810	52.9155	0.0000	2,218.2684
General Light Industry	11861.3	2,407.7448	142.2936	0.0000	5,965.0859
General Office Building	580.43	117.8220	6.9631	0.0000	291.8991
Library	747.33	151.7012	8.9653	0.0000	375.8334
Office Park	4227.61	858.1666	50.7162	0.0000	2,126.0715
Single Family Housing	20729.2	4,207.8382	248.6761	0.0000	10,424.7411
Strip Mall	3207.05	651.0022	38.4731	0.0000	1,612.8303
Total		**11,651.6001**	**688.5898**	**0.0000**	**28,866.3460**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Forest General Plan Buildout Year (2040)

Orange County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	17,023.00	Dwelling Unit	2,499.00	30,641,400.00	50559
Condo/Townhouse	9,589.00	Dwelling Unit	880.00	9,589,000.00	28481
Apartments Mid Rise	7,931.00	Dwelling Unit	361.00	7,931,000.00	23555
Apartments High Rise	620.00	Dwelling Unit	16.00	620,000.00	1840
Strip Mall	3,054.33	1000sqft	280.00	3,054,326.00	0
General Office Building	110.40	1000sqft	8.00	110,398.00	0
Office Park	4,545.82	1000sqft	298.00	4,545,819.00	0
General Light Industry	9,565.60	1000sqft	627.00	9,565,602.00	0
Library	811.51	1000sqft	373.00	811,507.00	0
Apartments Mid Rise	3,234.00	Dwelling Unit	101.00	3,234,000.00	9605
Apartments Mid Rise	7,567.00	Dwelling Unit	295.00	7,567,000.00	22473
Apartments High Rise	3,265.00	Dwelling Unit	68.00	3,265,000.00	9696
General Office Building	513.72	1000sqft	24.00	513,715.00	0
Apartments Mid Rise	1,155.00	Dwelling Unit	52.00	1,155,000.00	3430
Apartments High Rise	950.00	Dwelling Unit	26.00	950,000.00	2823
City Park	249.00	Acre	249.00	10,846,440.00	0
City Park	1,939.00	Acre	1,939.00	84,462,840.00	0
City Park	877.00	Acre	877.00	38,202,120.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Values as provided by the City of Lake Forest. Land uses types were selected based on best proxy for the land use designations provided. Unit amounts, lot acreages, and population provided by the City.

Construction Phase - Construction schedule asssumes buildout by 12/31/2040.

Grading - Assumes grading occurs over entire Planning Area (10,742 acres).

Trips and VMT - For 'Building Construction' & 'Architectural Coating' phases: for res. uses, assumes 24 worker & 8 vendor trips per housing unit/day. For non-res. uses, assumes 8 worker trips & 3 vendor trips per 1000 sf/day. =199 daily worker 68 daily vendor trips

Woodstoves - No hearths or fireplaces (not permitted in SCAQMD's jurisdiction).

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	11,000.00	674.00
tblConstructionPhase	NumDays	155,000.00	3,913.00
tblConstructionPhase	NumDays	15,500.00	261.00
tblConstructionPhase	NumDays	11,000.00	261.00
tblConstructionPhase	NumDays	6,000.00	262.00
tblConstructionPhase	PhaseEndDate	8/9/2819	12/31/2040
tblConstructionPhase	PhaseEndDate	4/12/2735	6/1/2038
tblConstructionPhase	PhaseEndDate	2/24/2141	6/1/2022
tblConstructionPhase	PhaseEndDate	6/10/2777	6/1/2023
tblConstructionPhase	PhaseEndDate	9/26/2081	6/1/2021
tblConstructionPhase	PhaseStartDate	6/11/2777	6/2/2038

tblConstructionPhase	PhaseStartDate	2/25/2141	6/2/2023
tblConstructionPhase	PhaseStartDate	9/27/2081	6/2/2021
tblConstructionPhase	PhaseStartDate	4/13/2735	6/2/2022
tblConstructionPhase	PhaseStartDate	9/28/2058	6/1/2020
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	4,109.75	0.00
tblFireplaces	NumberGas	16,903.95	0.00
tblFireplaces	NumberGas	8,150.65	0.00
tblFireplaces	NumberGas	14,469.55	0.00
tblFireplaces	NumberNoFireplace	483.50	0.00
tblFireplaces	NumberNoFireplace	1,988.70	0.00
tblFireplaces	NumberNoFireplace	958.90	0.00
tblFireplaces	NumberNoFireplace	1,702.30	0.00
tblFireplaces	NumberWood	241.75	0.00
tblFireplaces	NumberWood	994.35	0.00
tblFireplaces	NumberWood	479.45	0.00
tblFireplaces	NumberWood	851.15	0.00
tblGrading	AcresOfGrading	652.50	10,742.00
tblLandUse	LandUseSquareFeet	3,054,330.00	3,054,326.00
tblLandUse	LandUseSquareFeet	110,400.00	110,398.00
tblLandUse	LandUseSquareFeet	4,545,820.00	4,545,819.00
tblLandUse	LandUseSquareFeet	9,565,600.00	9,565,602.00
tblLandUse	LotAcreage	5,526.95	2,499.00
tblLandUse	LotAcreage	599.31	880.00

tblLandUse	LotAcreage	208.71	361.00
tblLandUse	LotAcreage	10.00	16.00
tblLandUse	LotAcreage	70.12	280.00
tblLandUse	LotAcreage	2.53	8.00
tblLandUse	LotAcreage	104.36	298.00
tblLandUse	LotAcreage	219.60	627.00
tblLandUse	LotAcreage	18.63	373.00
tblLandUse	LotAcreage	85.11	101.00
tblLandUse	LotAcreage	199.13	295.00
tblLandUse	LotAcreage	52.66	68.00
tblLandUse	LotAcreage	11.79	24.00
tblLandUse	LotAcreage	30.39	52.00
tblLandUse	LotAcreage	15.32	26.00
tblLandUse	Population	48,686.00	50,559.00
tblLandUse	Population	27,425.00	28,481.00
tblLandUse	Population	22,683.00	23,555.00
tblLandUse	Population	1,773.00	1,840.00
tblLandUse	Population	9,249.00	9,605.00
tblLandUse	Population	21,642.00	22,473.00
tblLandUse	Population	9,338.00	9,696.00
tblLandUse	Population	3,303.00	3,430.00
tblLandUse	Population	2,717.00	2,823.00
tblTripsAndVMT	VendorTripNumber	30,419.00	68.00
tblTripsAndVMT	WorkerTripNumber	93,897.00	199.00
tblTripsAndVMT	WorkerTripNumber	18,779.00	199.00
tblWoodstoves	NumberCatalytic	241.75	0.00
tblWoodstoves	NumberCatalytic	994.35	0.00

tblWoodstoves	NumberCatalytic	479.45	0.00
tblWoodstoves	NumberCatalytic	851.15	0.00
tblWoodstoves	NumberNoncatalytic	241.75	0.00
tblWoodstoves	NumberNoncatalytic	994.35	0.00
tblWoodstoves	NumberNoncatalytic	479.45	0.00
tblWoodstoves	NumberNoncatalytic	851.15	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1456	42.4609	22.1028	0.0400	18.2675	2.1987	20.4662	9.9840	2.0228	12.0069	0.0000	3,881.3094	3,881.3094	1.1963	0.0000	3,911.2171
2021	4.2634	46.4435	31.4859	0.0641	49.8927	2.0458	51.8795	9.9840	1.8821	11.8661	0.0000	6,217.4823	6,217.4823	1.9473	0.0000	6,266.1649
2022	3.6930	38.8830	29.6085	0.0641	49.8927	1.6363	51.5291	8.0824	1.5054	9.5878	0.0000	6,214.0508	6,214.0508	1.9483	0.0000	6,262.7584
2023	2.3455	19.2976	23.0641	0.0624	2.6588	0.7191	3.3779	0.7149	0.6764	1.3914	0.0000	6,248.8189	6,248.8189	0.7739	0.0000	6,268.1652
2024	2.2080	18.2677	22.5908	0.0615	2.6588	0.6323	3.2911	0.7149	0.5946	1.3095	0.0000	6,158.5412	6,158.5412	0.7650	0.0000	6,177.6666

Lake Forest General Plan Buildout Year (2040) - Orange County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2025	2.0734	17.2084	22.1655	0.0606	2.6588	0.5463	3.2051	0.7149	0.5137	1.2286	0.0000	6,073.2394	6,073.2394	0.7571	0.0000	6,092.1665
2026	2.0468	17.1273	21.8755	0.0599	2.6588	0.5458	3.2046	0.7149	0.5132	1.2281	0.0000	5,998.2608	5,998.2608	0.7530	0.0000	6,017.0850
2027	2.0211	17.0514	21.6221	0.0592	2.6588	0.5450	3.2038	0.7149	0.5125	1.2274	0.0000	5,932.5034	5,932.5034	0.7492	0.0000	5,951.2343
2028	1.9947	16.9863	21.4017	0.0586	2.6588	0.5439	3.2027	0.7149	0.5115	1.2264	0.0000	5,875.3685	5,875.3685	0.7459	0.0000	5,894.0160
2029	1.9659	16.9258	21.1927	0.0581	2.6588	0.5430	3.2018	0.7149	0.5106	1.2256	0.0000	5,825.2542	5,825.2542	0.7429	0.0000	5,843.8268
2030	1.8779	12.3342	21.0719	0.0617	2.6588	0.1628	2.8215	0.7149	0.1618	0.8767	0.0000	6,122.3423	6,122.3423	0.2554	0.0000	6,128.7280
2031	1.8451	12.2731	20.8917	0.0613	2.6588	0.1620	2.8208	0.7149	0.1610	0.8760	0.0000	6,081.0639	6,081.0639	0.2530	0.0000	6,087.3882
2032	1.8163	12.2254	20.7304	0.0609	2.6588	0.1613	2.8201	0.7149	0.1604	0.8753	0.0000	6,048.4018	6,048.4018	0.2509	0.0000	6,054.6737
2033	1.7917	12.1820	20.5914	0.0607	2.6588	0.1607	2.8195	0.7149	0.1599	0.8748	0.0000	6,020.3050	6,020.3050	0.2490	0.0000	6,026.5312
2034	1.7706	12.1427	20.4580	0.0604	2.6588	0.1601	2.8189	0.7149	0.1593	0.8743	0.0000	5,996.2514	5,996.2514	0.2474	0.0000	6,002.4360
2035	1.6605	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2036	1.6605	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2037	1.6605	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2038	859.2951	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2039	859.2951	0.9082	4.5126	0.0171	2.2244	0.0170	2.2413	0.5899	0.0164	0.6063	0.0000	1,691.5786	1,691.5786	0.0250	0.0000	1,692.2023
2040	859.2303	0.8556	4.1655	0.0166	2.2244	0.0130	2.2373	0.5899	0.0125	0.6024	0.0000	1,638.5797	1,638.5797	0.0217	0.0000	1,639.1233
Maximum	**859.2951**	**46.4435**	**31.4859**	**0.0641**	**49.8927**	**2.1987**	**51.8795**	**9.9840**	**2.0228**	**12.0069**	**0.0000**	**6,248.8189**	**6,248.8189**	**1.9483**	**0.0000**	**6,268.1652**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1456	42.4609	22.1028	0.0400	18.2675	2.1987	20.4662	9.9840	2.0228	12.0069	0.0000	3,881.3094	3,881.3094	1.1963	0.0000	3,911.2171
2021	4.2634	46.4435	31.4859	0.0641	49.8927	2.0458	51.8795	9.9840	1.8821	11.8661	0.0000	6,217.4823	6,217.4823	1.9473	0.0000	6,266.1649
2022	3.6930	38.8830	29.6085	0.0641	49.8927	1.6363	51.5291	8.0824	1.5054	9.5878	0.0000	6,214.0508	6,214.0508	1.9483	0.0000	6,262.7584
2023	2.3455	19.2976	23.0641	0.0624	2.6588	0.7191	3.3779	0.7149	0.6764	1.3914	0.0000	6,248.8189	6,248.8189	0.7739	0.0000	6,268.1652
2024	2.2080	18.2677	22.5908	0.0615	2.6588	0.6323	3.2911	0.7149	0.5946	1.3095	0.0000	6,158.5412	6,158.5412	0.7650	0.0000	6,177.6666
2025	2.0734	17.2084	22.1655	0.0606	2.6588	0.5463	3.2051	0.7149	0.5137	1.2286	0.0000	6,073.2394	6,073.2394	0.7571	0.0000	6,092.1665
2026	2.0468	17.1273	21.8755	0.0599	2.6588	0.5458	3.2046	0.7149	0.5132	1.2281	0.0000	5,998.2608	5,998.2608	0.7530	0.0000	6,017.0850
2027	2.0211	17.0514	21.6221	0.0592	2.6588	0.5450	3.2038	0.7149	0.5125	1.2274	0.0000	5,932.5034	5,932.5034	0.7492	0.0000	5,951.2343
2028	1.9947	16.9863	21.4017	0.0586	2.6588	0.5439	3.2027	0.7149	0.5115	1.2264	0.0000	5,875.3685	5,875.3685	0.7459	0.0000	5,894.0160
2029	1.9659	16.9258	21.1927	0.0581	2.6588	0.5430	3.2018	0.7149	0.5106	1.2256	0.0000	5,825.2542	5,825.2542	0.7429	0.0000	5,843.8268
2030	1.8779	12.3342	21.0719	0.0617	2.6588	0.1628	2.8215	0.7149	0.1618	0.8767	0.0000	6,122.3423	6,122.3423	0.2554	0.0000	6,128.7280
2031	1.8451	12.2731	20.8917	0.0613	2.6588	0.1620	2.8208	0.7149	0.1610	0.8760	0.0000	6,081.0639	6,081.0639	0.2530	0.0000	6,087.3882
2032	1.8163	12.2254	20.7304	0.0609	2.6588	0.1613	2.8201	0.7149	0.1604	0.8753	0.0000	6,048.4018	6,048.4018	0.2509	0.0000	6,054.6737
2033	1.7917	12.1820	20.5914	0.0607	2.6588	0.1607	2.8195	0.7149	0.1599	0.8748	0.0000	6,020.3050	6,020.3050	0.2490	0.0000	6,026.5312
2034	1.7706	12.1427	20.4580	0.0604	2.6588	0.1601	2.8189	0.7149	0.1593	0.8743	0.0000	5,996.2514	5,996.2514	0.2474	0.0000	6,002.4360

Lake Forest General Plan Buildout Year (2040) - Orange County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2035	1.6605	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2036	1.6605	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2037	1.6605	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2038	859.2951	11.3373	20.3051	0.0602	2.6588	0.1019	2.7607	0.7149	0.1011	0.8161	0.0000	5,976.0511	5,976.0511	0.2376	0.0000	5,981.9915
2039	859.2951	0.9082	4.5126	0.0171	2.2244	0.0170	2.2413	0.5899	0.0164	0.6063	0.0000	1,691.5786	1,691.5786	0.0250	0.0000	1,692.2023
2040	859.2303	0.8556	4.1655	0.0166	2.2244	0.0130	2.2373	0.5899	0.0125	0.6024	0.0000	1,638.5797	1,638.5797	0.0217	0.0000	1,639.1233
Maximum	**859.2951**	**46.4435**	**31.4859**	**0.0641**	**49.8927**	**2.1987**	**51.8795**	**9.9840**	**2.0228**	**12.0069**	**0.0000**	**6,248.8189**	**6,248.8189**	**1.9483**	**0.0000**	**6,268.1652**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425
Energy	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230
Mobile	1,249.4115	5,024.8906	16,409.9231	58.7091	5,021.0924	57.4359	5,078.5284	1,342.6783	53.8911	1,396.5694		5,951,684.7910	5,951,684.7910	250.1266		5,957,937.9551
Total	**3,233.4566**	**5,374.3287**	**20,820.3365**	**60.8207**	**5,021.0924**	**104.7209**	**5,125.8133**	**1,342.6783**	**101.1761**	**1,443.8543**	**0.0000**	**6,336,872.5077**	**6,336,872.5077**	**264.8117**	**6.9219**	**6,345,555.5205**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425
Energy	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230
Mobile	1,249.4115	5,024.8906	16,409.9231	58.7091	5,021.0924	57.4359	5,078.5284	1,342.6783	53.8911	1,396.5694		5,951,684.7910	5,951,684.7910	250.1266		5,957,937.9551
Total	**3,233.4566**	**5,374.3287**	**20,820.3365**	**60.8207**	**5,021.0924**	**104.7209**	**5,125.8133**	**1,342.6783**	**101.1761**	**1,443.8543**	**0.0000**	**6,336,872.5077**	**6,336,872.5077**	**264.8117**	**6.9219**	**6,345,555.5205**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2020	6/1/2021	5	262	
2	Grading	Grading	6/2/2021	6/1/2022	5	261	
3	Building Construction	Building Construction	6/2/2023	6/1/2038	5	3913	
4	Paving	Paving	6/2/2022	6/1/2023	5	261	
5	Architectural Coating	Architectural Coating	6/2/2038	12/31/2040	5	674	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10742

Acres of Paving: 0

Residential Indoor: 131,528,610; Residential Outdoor: 43,842,870; Non-Residential Indoor: 27,902,051; Non-Residential Outdoor: 9,300,684; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Forest General Plan Buildout Year (2040) - Orange County, Summer

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	199.00	68.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	199.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0692	0.0436	0.5892	1.9700e-003	0.2012	1.3300e-003	0.2025	0.0534	1.2300e-003	0.0546		196.2079	196.2079	4.4700e-003		196.3197
Total	**0.0692**	**0.0436**	**0.5892**	**1.9700e-003**	**0.2012**	**1.3300e-003**	**0.2025**	**0.0534**	**1.2300e-003**	**0.0546**		**196.2079**	**196.2079**	**4.4700e-003**		**196.3197**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0692	0.0436	0.5892	1.9700e-003	0.2012	1.3300e-003	0.2025	0.0534	1.2300e-003	0.0546		196.2079	196.2079	4.4700e-003		196.3197
Total	**0.0692**	**0.0436**	**0.5892**	**1.9700e-003**	**0.2012**	**1.3300e-003**	**0.2025**	**0.0534**	**1.2300e-003**	**0.0546**		**196.2079**	**196.2079**	**4.4700e-003**		**196.3197**

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0650	0.0393	0.5467	1.9000e-003	0.2012	1.3000e-003	0.2025	0.0534	1.2000e-003	0.0546		189.3950	189.3950	4.0600e-003		189.4963
Total	**0.0650**	**0.0393**	**0.5467**	**1.9000e-003**	**0.2012**	**1.3000e-003**	**0.2025**	**0.0534**	**1.2000e-003**	**0.0546**		**189.3950**	**189.3950**	**4.0600e-003**		**189.4963**

3.2 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0650	0.0393	0.5467	1.9000e-003	0.2012	1.3000e-003	0.2025	0.0534	1.2000e-003	0.0546		189.3950	189.3950	4.0600e-003		189.4963
Total	**0.0650**	**0.0393**	**0.5467**	**1.9000e-003**	**0.2012**	**1.3000e-003**	**0.2025**	**0.0534**	**1.2000e-003**	**0.0546**		**189.3950**	**189.3950**	**4.0600e-003**		**189.4963**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**49.6692**	**1.9853**	**51.6545**	**8.0231**	**1.8265**	**9.8496**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0722	0.0437	0.6075	2.1100e-003	0.2236	1.4500e-003	0.2250	0.0593	1.3300e-003	0.0606		210.4388	210.4388	4.5100e-003		210.5515
Total	**0.0722**	**0.0437**	**0.6075**	**2.1100e-003**	**0.2236**	**1.4500e-003**	**0.2250**	**0.0593**	**1.3300e-003**	**0.0606**		**210.4388**	**210.4388**	**4.5100e-003**		**210.5515**

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**49.6692**	**1.9853**	**51.6545**	**8.0231**	**1.8265**	**9.8496**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0722	0.0437	0.6075	2.1100e-003	0.2236	1.4500e-003	0.2250	0.0593	1.3300e-003	0.0606		210.4388	210.4388	4.5100e-003		210.5515
Total	**0.0722**	**0.0437**	**0.6075**	**2.1100e-003**	**0.2236**	**1.4500e-003**	**0.2250**	**0.0593**	**1.3300e-003**	**0.0606**		**210.4388**	**210.4388**	**4.5100e-003**		**210.5515**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041		6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**49.6692**	**1.6349**	**51.3041**	**8.0231**	**1.5041**	**9.5272**		**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0682	0.0396	0.5670	2.0300e-003	0.2236	1.4200e-003	0.2250	0.0593	1.3100e-003	0.0606		202.6403	202.6403	4.0900e-003		202.7426
Total	**0.0682**	**0.0396**	**0.5670**	**2.0300e-003**	**0.2236**	**1.4200e-003**	**0.2250**	**0.0593**	**1.3100e-003**	**0.0606**		**202.6403**	**202.6403**	**4.0900e-003**		**202.7426**

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041	0.0000	6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**49.6692**	**1.6349**	**51.3041**	**8.0231**	**1.5041**	**9.5272**	**0.0000**	**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0682	0.0396	0.5670	2.0300e-003	0.2236	1.4200e-003	0.2250	0.0593	1.3100e-003	0.0606		202.6403	202.6403	4.0900e-003		202.7426
Total	**0.0682**	**0.0396**	**0.5670**	**2.0300e-003**	**0.2236**	**1.4200e-003**	**0.2250**	**0.0593**	**1.3100e-003**	**0.0606**		**202.6403**	**202.6403**	**4.0900e-003**		**202.7426**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1298	4.5552	1.5592	0.0160	0.4344	5.4800e-003	0.4399	0.1250	5.2400e-003	0.1303		1,754.8525	1,754.8525	0.1291		1,758.0792
Worker	0.6429	0.3575	5.2609	0.0194	2.2244	0.0139	2.2382	0.5899	0.0128	0.6027		1,938.7565	1,938.7565	0.0369		1,939.6799
Total	**0.7727**	**4.9127**	**6.8201**	**0.0355**	**2.6588**	**0.0194**	**2.6782**	**0.7149**	**0.0180**	**0.7329**		**3,693.6090**	**3,693.6090**	**0.1660**		**3,697.7591**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1298	4.5552	1.5592	0.0160	0.4344	5.4800e-003	0.4399	0.1250	5.2400e-003	0.1303		1,754.8525	1,754.8525	0.1291		1,758.0792
Worker	0.6429	0.3575	5.2609	0.0194	2.2244	0.0139	2.2382	0.5899	0.0128	0.6027		1,938.7565	1,938.7565	0.0369		1,939.6799
Total	**0.7727**	**4.9127**	**6.8201**	**0.0355**	**2.6588**	**0.0194**	**2.6782**	**0.7149**	**0.0180**	**0.7329**		**3,693.6090**	**3,693.6090**	**0.1660**		**3,697.7591**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1254	4.4983	1.5268	0.0159	0.4344	5.3700e-003	0.4398	0.1250	5.1300e-003	0.1302		1,740.9126	1,740.9126	0.1271		1,744.0908
Worker	0.6109	0.3256	4.8971	0.0187	2.2244	0.0136	2.2380	0.5899	0.0126	0.6025		1,861.9296	1,861.9296	0.0335		1,862.7682
Total	**0.7364**	**4.8239**	**6.4239**	**0.0346**	**2.6588**	**0.0190**	**2.6778**	**0.7149**	**0.0177**	**0.7326**		**3,602.8423**	**3,602.8423**	**0.1607**		**3,606.8590**

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1254	4.4983	1.5268	0.0159	0.4344	5.3700e-003	0.4398	0.1250	5.1300e-003	0.1302		1,740.9126	1,740.9126	0.1271		1,744.0908
Worker	0.6109	0.3256	4.8971	0.0187	2.2244	0.0136	2.2380	0.5899	0.0126	0.6025		1,861.9296	1,861.9296	0.0335		1,862.7682
Total	**0.7364**	**4.8239**	**6.4239**	**0.0346**	**2.6588**	**0.0190**	**2.6778**	**0.7149**	**0.0177**	**0.7326**		**3,602.8423**	**3,602.8423**	**0.1607**		**3,606.8590**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1222	4.4401	1.5092	0.0158	0.4344	5.2600e-003	0.4397	0.1250	5.0300e-003	0.1300		1,730.1222	1,730.1222	0.1255		1,733.2586
Worker	0.5837	0.2986	4.5716	0.0179	2.2244	0.0135	2.2378	0.5899	0.0124	0.6023		1,786.6429	1,786.6429	0.0307		1,787.4098
Total	**0.7060**	**4.7387**	**6.0808**	**0.0337**	**2.6588**	**0.0187**	**2.6775**	**0.7149**	**0.0174**	**0.7323**		**3,516.7650**	**3,516.7650**	**0.1561**		**3,520.6684**

3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1222	4.4401	1.5092	0.0158	0.4344	5.2600e-003	0.4397	0.1250	5.0300e-003	0.1300		1,730.1222	1,730.1222	0.1255		1,733.2586
Worker	0.5837	0.2986	4.5716	0.0179	2.2244	0.0135	2.2378	0.5899	0.0124	0.6023		1,786.6429	1,786.6429	0.0307		1,787.4098
Total	**0.7060**	**4.7387**	**6.0808**	**0.0337**	**2.6588**	**0.0187**	**2.6775**	**0.7149**	**0.0174**	**0.7323**		**3,516.7650**	**3,516.7650**	**0.1561**		**3,520.6684**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1194	4.3819	1.4975	0.0157	0.4344	5.1400e-003	0.4396	0.1250	4.9200e-003	0.1299		1,719.7638	1,719.7638	0.1238		1,722.8592
Worker	0.5601	0.2757	4.2933	0.0173	2.2244	0.0131	2.2374	0.5899	0.0120	0.6019		1,722.0226	1,722.0226	0.0282		1,722.7278
Total	**0.6794**	**4.6576**	**5.7908**	**0.0329**	**2.6588**	**0.0182**	**2.6770**	**0.7149**	**0.0169**	**0.7319**		**3,441.7864**	**3,441.7864**	**0.1520**		**3,445.5869**

3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1194	4.3819	1.4975	0.0157	0.4344	5.1400e-003	0.4396	0.1250	4.9200e-003	0.1299		1,719.7638	1,719.7638	0.1238		1,722.8592
Worker	0.5601	0.2757	4.2933	0.0173	2.2244	0.0131	2.2374	0.5899	0.0120	0.6019		1,722.0226	1,722.0226	0.0282		1,722.7278
Total	**0.6794**	**4.6576**	**5.7908**	**0.0329**	**2.6588**	**0.0182**	**2.6770**	**0.7149**	**0.0169**	**0.7319**		**3,441.7864**	**3,441.7864**	**0.1520**		**3,445.5869**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1169	4.3263	1.4882	0.0156	0.4344	5.0400e-003	0.4395	0.1250	4.8200e-003	0.1298		1,710.2214	1,710.2214	0.1223		1,713.2782
Worker	0.5368	0.2554	4.0493	0.0167	2.2244	0.0124	2.2367	0.5899	0.0114	0.6013		1,665.8076	1,665.8076	0.0260		1,666.4580
Total	**0.6537**	**4.5817**	**5.5374**	**0.0323**	**2.6588**	**0.0174**	**2.6762**	**0.7149**	**0.0162**	**0.7311**		**3,376.0290**	**3,376.0290**	**0.1483**		**3,379.7362**

3.4 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1169	4.3263	1.4882	0.0156	0.4344	5.0400e-003	0.4395	0.1250	4.8200e-003	0.1298		1,710.2214	1,710.2214	0.1223		1,713.2782
Worker	0.5368	0.2554	4.0493	0.0167	2.2244	0.0124	2.2367	0.5899	0.0114	0.6013		1,665.8076	1,665.8076	0.0260		1,666.4580
Total	**0.6537**	**4.5817**	**5.5374**	**0.0323**	**2.6588**	**0.0174**	**2.6762**	**0.7149**	**0.0162**	**0.7311**		**3,376.0290**	**3,376.0290**	**0.1483**		**3,379.7362**

3.4 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1149	4.2793	1.4831	0.0155	0.4344	4.9400e-003	0.4394	0.1250	4.7300e-003	0.1297		1,701.9208	1,701.9208	0.1209		1,704.9422
Worker	0.5124	0.2373	3.8339	0.0162	2.2244	0.0114	2.2358	0.5899	0.0105	0.6004		1,616.9733	1,616.9733	0.0241		1,617.5758
Total	**0.6273**	**4.5166**	**5.3170**	**0.0317**	**2.6588**	**0.0164**	**2.6751**	**0.7149**	**0.0152**	**0.7302**		**3,318.8941**	**3,318.8941**	**0.1450**		**3,322.5180**

3.4 Building Construction - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1149	4.2793	1.4831	0.0155	0.4344	4.9400e-003	0.4394	0.1250	4.7300e-003	0.1297		1,701.9208	1,701.9208	0.1209		1,704.9422
Worker	0.5124	0.2373	3.8339	0.0162	2.2244	0.0114	2.2358	0.5899	0.0105	0.6004		1,616.9733	1,616.9733	0.0241		1,617.5758
Total	**0.6273**	**4.5166**	**5.3170**	**0.0317**	**2.6588**	**0.0164**	**2.6751**	**0.7149**	**0.0152**	**0.7302**		**3,318.8941**	**3,318.8941**	**0.1450**		**3,322.5180**

3.4 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1130	4.2354	1.4779	0.0154	0.4344	4.8600e-003	0.4393	0.1250	4.6400e-003	0.1297		1,694.4285	1,694.4285	0.1197		1,697.4199
Worker	0.4854	0.2207	3.6302	0.0158	2.2244	0.0106	2.2349	0.5899	9.7400e-003	0.5997		1,574.3514	1,574.3514	0.0223		1,574.9089
Total	**0.5985**	**4.4561**	**5.1080**	**0.0312**	**2.6588**	**0.0154**	**2.6742**	**0.7149**	**0.0144**	**0.7293**		**3,268.7798**	**3,268.7798**	**0.1420**		**3,272.3287**

3.4 Building Construction - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1130	4.2354	1.4779	0.0154	0.4344	4.8600e-003	0.4393	0.1250	4.6400e-003	0.1297		1,694.4285	1,694.4285	0.1197		1,697.4199
Worker	0.4854	0.2207	3.6302	0.0158	2.2244	0.0106	2.2349	0.5899	9.7400e-003	0.5997		1,574.3514	1,574.3514	0.0223		1,574.9089
Total	**0.5985**	**4.4561**	**5.1080**	**0.0312**	**2.6588**	**0.0154**	**2.6742**	**0.7149**	**0.0144**	**0.7293**		**3,268.7798**	**3,268.7798**	**0.1420**		**3,272.3287**

3.4 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.1944	1.4731	0.0153	0.4344	4.7700e-003	0.4392	0.1250	4.5600e-003	0.1296		1,687.6909	1,687.6909	0.1185		1,690.6540
Worker	0.4574	0.2052	3.4419	0.0154	2.2244	9.8400e-003	2.2342	0.5899	9.0500e-003	0.5990		1,537.1047	1,537.1047	0.0207		1,537.6212
Total	**0.5687**	**4.3996**	**4.9149**	**0.0307**	**2.6588**	**0.0146**	**2.6734**	**0.7149**	**0.0136**	**0.7285**		**3,224.7956**	**3,224.7956**	**0.1392**		**3,228.2752**

3.4 Building Construction - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.1944	1.4731	0.0153	0.4344	4.7700e-003	0.4392	0.1250	4.5600e-003	0.1296		1,687.6909	1,687.6909	0.1185		1,690.6540
Worker	0.4574	0.2052	3.4419	0.0154	2.2244	9.8400e-003	2.2342	0.5899	9.0500e-003	0.5990		1,537.1047	1,537.1047	0.0207		1,537.6212
Total	**0.5687**	**4.3996**	**4.9149**	**0.0307**	**2.6588**	**0.0146**	**2.6734**	**0.7149**	**0.0136**	**0.7285**		**3,224.7956**	**3,224.7956**	**0.1392**		**3,228.2752**

3.4 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1099	4.1483	1.4715	0.0153	0.4344	4.6900e-003	0.4391	0.1250	4.4900e-003	0.1295		1,682.4659	1,682.4659	0.1177		1,685.4082
Worker	0.4261	0.1902	3.2632	0.0150	2.2244	9.1400e-003	2.2335	0.5899	8.4100e-003	0.5983		1,501.0512	1,501.0512	0.0190		1,501.5271
Total	**0.5360**	**4.3385**	**4.7347**	**0.0303**	**2.6588**	**0.0138**	**2.6726**	**0.7149**	**0.0129**	**0.7278**		**3,183.5171**	**3,183.5171**	**0.1367**		**3,186.9353**

3.4 Building Construction - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1099	4.1483	1.4715	0.0153	0.4344	4.6900e-003	0.4391	0.1250	4.4900e-003	0.1295		1,682.4659	1,682.4659	0.1177		1,685.4082
Worker	0.4261	0.1902	3.2632	0.0150	2.2244	9.1400e-003	2.2335	0.5899	8.4100e-003	0.5983		1,501.0512	1,501.0512	0.0190		1,501.5271
Total	**0.5360**	**4.3385**	**4.7347**	**0.0303**	**2.6588**	**0.0138**	**2.6726**	**0.7149**	**0.0129**	**0.7278**		**3,183.5171**	**3,183.5171**	**0.1367**		**3,186.9353**

3.4 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1088	4.1133	1.4713	0.0152	0.4344	4.6300e-003	0.4391	0.1250	4.4200e-003	0.1294		1,677.9258	1,677.9258	0.1169		1,680.8494
Worker	0.3984	0.1775	3.1021	0.0148	2.2244	8.5400e-003	2.2329	0.5899	7.8500e-003	0.5978		1,472.9293	1,472.9293	0.0177		1,473.3715
Total	**0.5072**	**4.2908**	**4.5734**	**0.0300**	**2.6588**	**0.0132**	**2.6720**	**0.7149**	**0.0123**	**0.7272**		**3,150.8551**	**3,150.8551**	**0.1346**		**3,154.2208**

3.4 Building Construction - 2032

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1088	4.1133	1.4713	0.0152	0.4344	4.6300e-003	0.4391	0.1250	4.4200e-003	0.1294		1,677.9258	1,677.9258	0.1169		1,680.8494
Worker	0.3984	0.1775	3.1021	0.0148	2.2244	8.5400e-003	2.2329	0.5899	7.8500e-003	0.5978		1,472.9293	1,472.9293	0.0177		1,473.3715
Total	**0.5072**	**4.2908**	**4.5734**	**0.0300**	**2.6588**	**0.0132**	**2.6720**	**0.7149**	**0.0123**	**0.7272**		**3,150.8551**	**3,150.8551**	**0.1346**		**3,154.2208**

3.4 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1079	4.0807	1.4720	0.0152	0.4344	4.5600e-003	0.4390	0.1250	4.3600e-003	0.1294		1,674.0560	1,674.0560	0.1163		1,676.9629
Worker	0.3747	0.1667	2.9624	0.0145	2.2244	8.0000e-003	2.2324	0.5899	7.3600e-003	0.5973		1,448.7022	1,448.7022	0.0165		1,449.1155
Total	**0.4826**	**4.2474**	**4.4344**	**0.0297**	**2.6588**	**0.0126**	**2.6714**	**0.7149**	**0.0117**	**0.7266**		**3,122.7582**	**3,122.7582**	**0.1328**		**3,126.0783**

3.4 Building Construction - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1079	4.0807	1.4720	0.0152	0.4344	4.5600e-003	0.4390	0.1250	4.3600e-003	0.1294		1,674.0560	1,674.0560	0.1163		1,676.9629
Worker	0.3747	0.1667	2.9624	0.0145	2.2244	8.0000e-003	2.2324	0.5899	7.3600e-003	0.5973		1,448.7022	1,448.7022	0.0165		1,449.1155
Total	**0.4826**	**4.2474**	**4.4344**	**0.0297**	**2.6588**	**0.0126**	**2.6714**	**0.7149**	**0.0117**	**0.7266**		**3,122.7582**	**3,122.7582**	**0.1328**		**3,126.0783**

3.4 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1071	4.0507	1.4710	0.0152	0.4344	4.4900e-003	0.4389	0.1250	4.3000e-003	0.1293		1,670.8829	1,670.8829	0.1157		1,673.7751
Worker	0.3544	0.1575	2.8300	0.0143	2.2244	7.5000e-003	2.2319	0.5899	6.8900e-003	0.5968		1,427.8218	1,427.8218	0.0155		1,428.2080
Total	**0.4615**	**4.2081**	**4.3010**	**0.0294**	**2.6588**	**0.0120**	**2.6708**	**0.7149**	**0.0112**	**0.7261**		**3,098.7047**	**3,098.7047**	**0.1311**		**3,101.9832**

3.4 Building Construction - 2034

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1071	4.0507	1.4710	0.0152	0.4344	4.4900e-003	0.4389	0.1250	4.3000e-003	0.1293		1,670.8829	1,670.8829	0.1157		1,673.7751
Worker	0.3544	0.1575	2.8300	0.0143	2.2244	7.5000e-003	2.2319	0.5899	6.8900e-003	0.5968		1,427.8218	1,427.8218	0.0155		1,428.2080
Total	**0.4615**	**4.2081**	**4.3010**	**0.0294**	**2.6588**	**0.0120**	**2.6708**	**0.7149**	**0.0112**	**0.7261**		**3,098.7047**	**3,098.7047**	**0.1311**		**3,101.9832**

3.4 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.4 Building Construction - 2035

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.4 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.4 Building Construction - 2036

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.4 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.4 Building Construction - 2037

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.4 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.4 Building Construction - 2038

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1063	4.0255	1.4690	0.0151	0.4344	4.4400e-003	0.4389	0.1250	4.2400e-003	0.1293		1,668.3739	1,668.3739	0.1151		1,671.2524
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.4437**	**4.1760**	**4.1873**	**0.0292**	**2.6588**	**0.0115**	**2.6703**	**0.7149**	**0.0107**	**0.7257**		**3,078.5044**	**3,078.5044**	**0.1297**		**3,081.7467**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0512	0.0297	0.4252	1.5200e-003	0.1677	1.0600e-003	0.1687	0.0445	9.8000e-004	0.0455		151.9802	151.9802	3.0700e-003		152.0569
Total	**0.0512**	**0.0297**	**0.4252**	**1.5200e-003**	**0.1677**	**1.0600e-003**	**0.1687**	**0.0445**	**9.8000e-004**	**0.0455**		**151.9802**	**151.9802**	**3.0700e-003**		**152.0569**

3.5 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0512	0.0297	0.4252	1.5200e-003	0.1677	1.0600e-003	0.1687	0.0445	9.8000e-004	0.0455		151.9802	151.9802	3.0700e-003		152.0569
Total	**0.0512**	**0.0297**	**0.4252**	**1.5200e-003**	**0.1677**	**1.0600e-003**	**0.1687**	**0.0445**	**9.8000e-004**	**0.0455**		**151.9802**	**151.9802**	**3.0700e-003**		**152.0569**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0485	0.0270	0.3966	1.4600e-003	0.1677	1.0500e-003	0.1687	0.0445	9.6000e-004	0.0454		146.1374	146.1374	2.7800e-003		146.2070
Total	**0.0485**	**0.0270**	**0.3966**	**1.4600e-003**	**0.1677**	**1.0500e-003**	**0.1687**	**0.0445**	**9.6000e-004**	**0.0454**		**146.1374**	**146.1374**	**2.7800e-003**		**146.2070**

3.5 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0485	0.0270	0.3966	1.4600e-003	0.1677	1.0500e-003	0.1687	0.0445	9.6000e-004	0.0454		146.1374	146.1374	2.7800e-003		146.2070
Total	**0.0485**	**0.0270**	**0.3966**	**1.4600e-003**	**0.1677**	**1.0500e-003**	**0.1687**	**0.0445**	**9.6000e-004**	**0.0454**		**146.1374**	**146.1374**	**2.7800e-003**		**146.2070**

3.6 Architectural Coating - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003		281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**		**281.4481**	**281.4481**	**0.0104**		**281.7081**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.3373**	**0.1505**	**2.7183**	**0.0141**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,410.1305**	**1,410.1305**	**0.0146**		**1,410.4943**

3.6 Architectural Coating - 2038

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003	0.0000	281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0104**		**281.7081**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.3373**	**0.1505**	**2.7183**	**0.0141**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,410.1305**	**1,410.1305**	**0.0146**		**1,410.4943**

3.6 Architectural Coating - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003		281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**		**281.4481**	**281.4481**	**0.0104**		**281.7081**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.3373**	**0.1505**	**2.7183**	**0.0141**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,410.1305**	**1,410.1305**	**0.0146**		**1,410.4943**

3.6 Architectural Coating - 2039

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003	0.0000	281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0104**		**281.7081**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3373	0.1505	2.7183	0.0141	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,410.1305	1,410.1305	0.0146		1,410.4943
Total	**0.3373**	**0.1505**	**2.7183**	**0.0141**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,410.1305**	**1,410.1305**	**0.0146**		**1,410.4943**

3.6 Architectural Coating - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**858.9548**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2755	0.1286	2.3732	0.0136	2.2244	5.5400e-003	2.2299	0.5899	5.1000e-003	0.5950		1,357.1317	1,357.1317	0.0118		1,357.4277
Total	**0.2755**	**0.1286**	**2.3732**	**0.0136**	**2.2244**	**5.5400e-003**	**2.2299**	**0.5899**	**5.1000e-003**	**0.5950**		**1,357.1317**	**1,357.1317**	**0.0118**		**1,357.4277**

3.6 Architectural Coating - 2040

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**858.9548**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.2755	0.1286	2.3732	0.0136	2.2244	5.5400e-003	2.2299	0.5899	5.1000e-003	0.5950		1,357.1317	1,357.1317	0.0118		1,357.4277
Total	**0.2755**	**0.1286**	**2.3732**	**0.0136**	**2.2244**	**5.5400e-003**	**2.2299**	**0.5899**	**5.1000e-003**	**0.5950**		**1,357.1317**	**1,357.1317**	**0.0118**		**1,357.4277**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1,249.4115	5,024.8906	16,409.9231	58.7091	5,021.0924	57.4359	5,078.5284	1,342.6783	53.8911	1,396.5694		5,951,684.7910	5,951,684.7910	250.1266		5,957,937.9551
Unmitigated	1,249.4115	5,024.8906	16,409.9231	58.7091	5,021.0924	57.4359	5,078.5284	1,342.6783	53.8911	1,396.5694		5,951,684.7910	5,951,684.7910	250.1266		5,957,937.9551

4.2 Trip Summary Information

Lake Forest General Plan Buildout Year (2040) - Orange County, Summer

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	2,604.00	3,087.60	2263.00	8,967,876	8,967,876
Apartments High Rise	13,713.00	16,259.70	11917.25	47,225,991	47,225,991
Apartments High Rise	3,990.00	4,731.00	3467.50	13,741,100	13,741,100
Apartments Mid Rise	52,741.15	50,679.09	46475.66	176,159,307	176,159,307
Apartments Mid Rise	21,506.10	20,665.26	18951.24	71,831,951	71,831,951
Apartments Mid Rise	50,320.55	48,353.13	44342.62	168,074,326	168,074,326
Apartments Mid Rise	7,680.75	7,380.45	6768.30	25,654,268	25,654,268
Condo/Townhouse	55,712.09	54,369.63	46410.76	185,180,754	185,180,754
Single Family Housing	162,058.96	168,697.93	146738.26	549,541,973	549,541,973
General Office Building	1,217.71	271.58	115.92	2,980,341	2,980,341
General Office Building	5,666.28	1,263.74	539.40	13,868,169	13,868,169
Office Park	51,913.26	7,455.14	3454.82	130,549,274	130,549,274
Strip Mall	135,367.91	128,404.03	62399.96	235,824,920	235,824,920
General Light Industry	66,672.25	12,626.59	6504.61	222,990,616	222,990,616
Library	45,639.15	37,775.65	20685.31	103,388,312	103,388,312
City Park	470.61	5,664.75	4168.26	5,009,411	5,009,411
City Park	3,664.71	44,112.25	32458.86	39,009,027	39,009,027
City Park	1,657.53	19,951.75	14680.98	17,643,588	17,643,588
Total	682,596.01	631,749.29	472,342.72	2,017,641,204	2,017,641,204

4.3 Trip Type Information

Lake Forest General Plan Buildout Year (2040) - Orange County, Summer

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Office Park	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15
General Light Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3
Library	16.60	8.40	6.90	52.00	43.00	5.00	44	44	12
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Apartments Mid Rise	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Condo/Townhouse	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Single Family Housing	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
General Office Building	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Office Park	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Strip Mall	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
General Light Industry	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Library	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
City Park	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230
NaturalGas Unmitigated	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230

5.2 Energy by Land Use - NaturalGas

Unmitigated

Lake Forest General Plan Buildout Year (2040) - Orange County, Summer

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments High Rise	29742.7	0.3208	2.7410	1.1664	0.0175		0.2216	0.2216		0.2216	0.2216		3,499.1417	3,499.1417	0.0671	0.0642	3,519.9353
Apartments High Rise	102221	1.1024	9.4204	4.0087	0.0601		0.7617	0.7617		0.7617	0.7617		12,025.9974	12,025.9974	0.2305	0.2205	12,097.4619
Apartments High Rise	19411	0.2093	1.7889	0.7612	0.0114		0.1446	0.1446		0.1446	0.1446		2,283.6504	2,283.6504	0.0438	0.0419	2,297.2209
Apartments Mid Rise	101250	1.0919	9.3309	3.9706	0.0596		0.7544	0.7544		0.7544	0.7544		11,911.8149	11,911.8149	0.2283	0.2184	11,982.6008
Apartments Mid Rise	236908	2.5549	21.8327	9.2905	0.1394		1.7652	1.7652		1.7652	1.7652		27,871.5842	27,871.5842	0.5342	0.5110	28,037.2110
Apartments Mid Rise	248305	2.6778	22.8830	9.7374	0.1461		1.8501	1.8501		1.8501	1.8501		29,212.3079	29,212.3079	0.5599	0.5356	29,385.9020
Apartments Mid Rise	36160.9	0.3900	3.3325	1.4181	0.0213		0.2694	0.2694		0.2694	0.2694		4,254.2196	4,254.2196	0.0815	0.0780	4,279.5003
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	463572	4.9993	42.7214	18.1793	0.2727		3.4541	3.4541		3.4541	3.4541		54,537.9359	54,537.9359	1.0453	0.9999	54,862.0276
General Light Industry	547729	5.9069	53.6989	45.1071	0.3222		4.0811	4.0811		4.0811	4.0811		64,438.7049	64,438.7049	1.2351	1.1814	64,821.6319
General Office Building	12864	0.1387	1.2612	1.0594	7.5700e-003		0.0959	0.0959		0.0959	0.0959		1,513.4102	1,513.4102	0.0290	0.0278	1,522.4036
General Office Building	2764.49	0.0298	0.2710	0.2277	1.6300e-003		0.0206	0.0206		0.0206	0.0206		325.2338	325.2338	6.2300e-003	5.9600e-003	327.1665
Library	46467.1	0.5011	4.5556	3.8267	0.0273		0.3462	0.3462		0.3462	0.3462		5,466.7192	5,466.7192	0.1048	0.1002	5,499.2052
Office Park	141605	1.5271	13.8829	11.6616	0.0833		1.0551	1.0551		1.0551	1.0551		16,659.4559	16,659.4559	0.3193	0.3054	16,758.4548
Single Family Housing	1.2035e+006	12.9789	110.9107	47.1960	0.7079		8.9672	8.9672		8.9672	8.9672		141,588.0686	141,588.0686	2.7138	2.5958	142,429.4557
Strip Mall	16736	0.1805	1.6408	1.3783	9.8400e-003		0.1247	0.1247		0.1247	0.1247		1,968.9450	1,968.9450	0.0377	0.0361	1,980.6455
Total		**34.6094**	**300.2717**	**158.9890**	**1.8878**		**23.9120**	**23.9120**		**23.9120**	**23.9120**		**377,557.1894**	**377,557.1894**	**7.2365**	**6.9219**	**379,800.8230**

5.2 Energy by Land Use - NaturalGas

Mitigated

Lake Forest General Plan Buildout Year (2040) - Orange County, Summer

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments High Rise	102.221	1.1024	9.4204	4.0087	0.0601		0.7617	0.7617		0.7617	0.7617		12,025.9974	12,025.9974	0.2305	0.2205	12,097.4619
Apartments High Rise	19.411	0.2093	1.7889	0.7612	0.0114		0.1446	0.1446		0.1446	0.1446		2,283.6504	2,283.6504	0.0438	0.0419	2,297.2209
Apartments High Rise	29.7427	0.3208	2.7410	1.1664	0.0175		0.2216	0.2216		0.2216	0.2216		3,499.1417	3,499.1417	0.0671	0.0642	3,519.9353
Apartments Mid Rise	101.25	1.0919	9.3309	3.9706	0.0596		0.7544	0.7544		0.7544	0.7544		11,911.8149	11,911.8149	0.2283	0.2184	11,982.6008
Apartments Mid Rise	236.908	2.5549	21.8327	9.2905	0.1394		1.7652	1.7652		1.7652	1.7652		27,871.5842	27,871.5842	0.5342	0.5110	28,037.2110
Apartments Mid Rise	248.305	2.6778	22.8830	9.7374	0.1461		1.8501	1.8501		1.8501	1.8501		29,212.3079	29,212.3079	0.5599	0.5356	29,385.9020
Apartments Mid Rise	36.1609	0.3900	3.3325	1.4181	0.0213		0.2694	0.2694		0.2694	0.2694		4,254.2196	4,254.2196	0.0815	0.0780	4,279.5003
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	463.572	4.9993	42.7214	18.1793	0.2727		3.4541	3.4541		3.4541	3.4541		54,537.9359	54,537.9359	1.0453	0.9999	54,862.0276
General Light Industry	547.729	5.9069	53.6989	45.1071	0.3222		4.0811	4.0811		4.0811	4.0811		64,438.7049	64,438.7049	1.2351	1.1814	64,821.6319
General Office Building	12.864	0.1387	1.2612	1.0594	7.5700e-003		0.0959	0.0959		0.0959	0.0959		1,513.4102	1,513.4102	0.0290	0.0278	1,522.4036
General Office Building	2.76449	0.0298	0.2710	0.2277	1.6300e-003		0.0206	0.0206		0.0206	0.0206		325.2338	325.2338	6.2300e-003	5.9600e-003	327.1665
Library	46.4671	0.5011	4.5556	3.8267	0.0273		0.3462	0.3462		0.3462	0.3462		5,466.7192	5,466.7192	0.1048	0.1002	5,499.2052
Office Park	141.605	1.5271	13.8829	11.6616	0.0833		1.0551	1.0551		1.0551	1.0551		16,659.4559	16,659.4559	0.3193	0.3054	16,758.4548
Single Family Housing	1203.5	12.9789	110.9107	47.1960	0.7079		8.9672	8.9672		8.9672	8.9672		141,588.0686	141,588.0686	2.7138	2.5958	142,429.4557
Strip Mall	16.736	0.1805	1.6408	1.3783	9.8400e-003		0.1247	0.1247		0.1247	0.1247		1,968.9450	1,968.9450	0.0377	0.0361	1,980.6455
Total		**34.6094**	**300.2717**	**158.9890**	**1.8878**		**23.9120**	**23.9120**		**23.9120**	**23.9120**		**377,557.1894**	**377,557.1894**	**7.2365**	**6.9219**	**379,800.8230**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425
Unmitigated	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	158.5913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1,661.2431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	129.6013	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730		7,630.5273	7,630.5273	7.4486		7,816.7425
Total	**1,949.4357**	**49.1664**	**4,251.4245**	**0.2238**		**23.3730**	**23.3730**		**23.3730**	**23.3730**	**0.0000**	**7,630.5273**	**7,630.5273**	**7.4486**	**0.0000**	**7,816.7425**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	158.5913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1,661.2431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	129.6013	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730		7,630.5273	7,630.5273	7.4486		7,816.7425
Total	**1,949.4357**	**49.1664**	**4,251.4245**	**0.2238**		**23.3730**	**23.3730**		**23.3730**	**23.3730**	**0.0000**	**7,630.5273**	**7,630.5273**	**7.4486**	**0.0000**	**7,816.7425**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Lake Forest General Plan Buildout Year (2040)

Orange County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	17,023.00	Dwelling Unit	2,499.00	30,641,400.00	50559
Condo/Townhouse	9,589.00	Dwelling Unit	880.00	9,589,000.00	28481
Apartments Mid Rise	7,931.00	Dwelling Unit	361.00	7,931,000.00	23555
Apartments High Rise	620.00	Dwelling Unit	16.00	620,000.00	1840
Strip Mall	3,054.33	1000sqft	280.00	3,054,326.00	0
General Office Building	110.40	1000sqft	8.00	110,398.00	0
Office Park	4,545.82	1000sqft	298.00	4,545,819.00	0
General Light Industry	9,565.60	1000sqft	627.00	9,565,602.00	0
Library	811.51	1000sqft	373.00	811,507.00	0
Apartments Mid Rise	3,234.00	Dwelling Unit	101.00	3,234,000.00	9605
Apartments Mid Rise	7,567.00	Dwelling Unit	295.00	7,567,000.00	22473
Apartments High Rise	3,265.00	Dwelling Unit	68.00	3,265,000.00	9696
General Office Building	513.72	1000sqft	24.00	513,715.00	0
Apartments Mid Rise	1,155.00	Dwelling Unit	52.00	1,155,000.00	3430
Apartments High Rise	950.00	Dwelling Unit	26.00	950,000.00	2823
City Park	249.00	Acre	249.00	10,846,440.00	0
City Park	1,939.00	Acre	1,939.00	84,462,840.00	0
City Park	877.00	Acre	877.00	38,202,120.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	30
Climate Zone	8			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Values as provided by the City of Lake Forest. Land uses types were selected based on best proxy for the land use designations provided. Unit amounts, lot acreages, and population provided by the City.

Construction Phase - Construction schedule asssumes buildout by 12/31/2040.

Grading - Assumes grading occurs over entire Planning Area (10,742 acres).

Trips and VMT - For 'Building Construction' & 'Architectural Coating' phases: for res. uses, assumes 24 worker & 8 vendor trips per housing unit/day. For non-res. uses, assumes 8 worker trips & 3 vendor trips per 1000 sf/day. =199 daily worker 68 daily vendor trips

Woodstoves - No hearths or fireplaces (not permitted in SCAQMD's jurisdiction).

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	11,000.00	674.00
tblConstructionPhase	NumDays	155,000.00	3,913.00
tblConstructionPhase	NumDays	15,500.00	261.00
tblConstructionPhase	NumDays	11,000.00	261.00
tblConstructionPhase	NumDays	6,000.00	262.00
tblConstructionPhase	PhaseEndDate	8/9/2819	12/31/2040
tblConstructionPhase	PhaseEndDate	4/12/2735	6/1/2038
tblConstructionPhase	PhaseEndDate	2/24/2141	6/1/2022
tblConstructionPhase	PhaseEndDate	6/10/2777	6/1/2023
tblConstructionPhase	PhaseEndDate	9/26/2081	6/1/2021
tblConstructionPhase	PhaseStartDate	6/11/2777	6/2/2038

tblConstructionPhase	PhaseStartDate	2/25/2141	6/2/2023
tblConstructionPhase	PhaseStartDate	9/27/2081	6/2/2021
tblConstructionPhase	PhaseStartDate	4/13/2735	6/2/2022
tblConstructionPhase	PhaseStartDate	9/28/2058	6/1/2020
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberGas	4,109.75	0.00
tblFireplaces	NumberGas	16,903.95	0.00
tblFireplaces	NumberGas	8,150.65	0.00
tblFireplaces	NumberGas	14,469.55	0.00
tblFireplaces	NumberNoFireplace	483.50	0.00
tblFireplaces	NumberNoFireplace	1,988.70	0.00
tblFireplaces	NumberNoFireplace	958.90	0.00
tblFireplaces	NumberNoFireplace	1,702.30	0.00
tblFireplaces	NumberWood	241.75	0.00
tblFireplaces	NumberWood	994.35	0.00
tblFireplaces	NumberWood	479.45	0.00
tblFireplaces	NumberWood	851.15	0.00
tblGrading	AcresOfGrading	652.50	10,742.00
tblLandUse	LandUseSquareFeet	3,054,330.00	3,054,326.00
tblLandUse	LandUseSquareFeet	110,400.00	110,398.00
tblLandUse	LandUseSquareFeet	4,545,820.00	4,545,819.00
tblLandUse	LandUseSquareFeet	9,565,600.00	9,565,602.00
tblLandUse	LotAcreage	5,526.95	2,499.00
tblLandUse	LotAcreage	599.31	880.00

tblLandUse	LotAcreage	208.71	361.00
tblLandUse	LotAcreage	10.00	16.00
tblLandUse	LotAcreage	70.12	280.00
tblLandUse	LotAcreage	2.53	8.00
tblLandUse	LotAcreage	104.36	298.00
tblLandUse	LotAcreage	219.60	627.00
tblLandUse	LotAcreage	18.63	373.00
tblLandUse	LotAcreage	85.11	101.00
tblLandUse	LotAcreage	199.13	295.00
tblLandUse	LotAcreage	52.66	68.00
tblLandUse	LotAcreage	11.79	24.00
tblLandUse	LotAcreage	30.39	52.00
tblLandUse	LotAcreage	15.32	26.00
tblLandUse	Population	48,686.00	50,559.00
tblLandUse	Population	27,425.00	28,481.00
tblLandUse	Population	22,683.00	23,555.00
tblLandUse	Population	1,773.00	1,840.00
tblLandUse	Population	9,249.00	9,605.00
tblLandUse	Population	21,642.00	22,473.00
tblLandUse	Population	9,338.00	9,696.00
tblLandUse	Population	3,303.00	3,430.00
tblLandUse	Population	2,717.00	2,823.00
tblTripsAndVMT	VendorTripNumber	30,419.00	68.00
tblTripsAndVMT	WorkerTripNumber	93,897.00	199.00
tblTripsAndVMT	WorkerTripNumber	18,779.00	199.00
tblWoodstoves	NumberCatalytic	241.75	0.00
tblWoodstoves	NumberCatalytic	994.35	0.00

tblWoodstoves	NumberCatalytic	479.45	0.00
tblWoodstoves	NumberCatalytic	851.15	0.00
tblWoodstoves	NumberNoncatalytic	241.75	0.00
tblWoodstoves	NumberNoncatalytic	994.35	0.00
tblWoodstoves	NumberNoncatalytic	479.45	0.00
tblWoodstoves	NumberNoncatalytic	851.15	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00
tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1546	42.4652	22.0582	0.0399	18.2675	2.1987	20.4662	9.9840	2.0228	12.0069	0.0000	3,870.7934	3,870.7934	1.1961	0.0000	3,900.6952
2021	4.2729	46.4478	31.4390	0.0640	49.8927	2.0458	51.8795	9.9840	1.8821	11.8661	0.0000	6,206.2099	6,206.2099	1.9471	0.0000	6,254.8865
2022	3.7023	38.8870	29.5639	0.0640	49.8927	1.6363	51.5291	8.0824	1.5054	9.5878	0.0000	6,203.2063	6,203.2063	1.9481	0.0000	6,251.9084
2023	2.4410	19.3067	22.7652	0.0610	2.6588	0.7194	3.3782	0.7149	0.6768	1.3917	0.0000	6,102.6080	6,102.6080	0.7771	0.0000	6,122.0363
2024	2.3012	18.2743	22.3128	0.0601	2.6588	0.6326	3.2914	0.7149	0.5949	1.3098	0.0000	6,017.0064	6,017.0064	0.7682	0.0000	6,036.2101

Lake Forest General Plan Buildout Year (2040) - Orange County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2025	2.1644	17.2128	21.9078	0.0593	2.6588	0.5466	3.2053	0.7149	0.5139	1.2289	0.0000	5,936.3657	5,936.3657	0.7601	0.0000	5,955.3677
2026	2.1362	17.1299	21.6349	0.0586	2.6588	0.5460	3.2048	0.7149	0.5134	1.2283	0.0000	5,865.4045	5,865.4045	0.7559	0.0000	5,884.3007
2027	2.1084	17.0521	21.3966	0.0580	2.6588	0.5452	3.2040	0.7149	0.5127	1.2276	0.0000	5,803.1036	5,803.1036	0.7520	0.0000	5,821.9037
2028	2.0794	16.9857	21.1896	0.0574	2.6588	0.5441	3.2029	0.7149	0.5117	1.2266	0.0000	5,748.9939	5,748.9939	0.7486	0.0000	5,767.7084
2029	2.0475	16.9237	20.9930	0.0569	2.6588	0.5432	3.2020	0.7149	0.5108	1.2257	0.0000	5,701.4788	5,701.4788	0.7455	0.0000	5,720.1165
2030	1.9560	12.3307	20.8837	0.0605	2.6588	0.1629	2.8217	0.7149	0.1619	0.8768	0.0000	6,000.7808	6,000.7808	0.2580	0.0000	6,007.2302
2031	1.9190	12.2678	20.7135	0.0601	2.6588	0.1621	2.8209	0.7149	0.1612	0.8761	0.0000	5,961.5257	5,961.5257	0.2555	0.0000	5,967.9130
2032	1.8863	12.2187	20.5621	0.0598	2.6588	0.1614	2.8202	0.7149	0.1605	0.8755	0.0000	5,930.4334	5,930.4334	0.2534	0.0000	5,936.7675
2033	1.8585	12.1741	20.4319	0.0595	2.6588	0.1608	2.8196	0.7149	0.1600	0.8749	0.0000	5,903.6473	5,903.6473	0.2515	0.0000	5,909.9351
2034	1.8345	12.1339	20.3067	0.0593	2.6588	0.1602	2.8190	0.7149	0.1594	0.8743	0.0000	5,880.6796	5,880.6796	0.2498	0.0000	5,886.9255
2035	1.7221	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2036	1.7221	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2037	1.7221	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2038	859.3517	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2039	859.3517	0.9226	4.2647	0.0163	2.2244	0.0170	2.2413	0.5899	0.0164	0.6063	0.0000	1,615.7617	1,615.7617	0.0240	0.0000	1,616.3624
2040	859.2780	0.8678	3.9403	0.0158	2.2244	0.0130	2.2373	0.5899	0.0125	0.6024	0.0000	1,565.4714	1,565.4714	0.0210	0.0000	1,565.9952
Maximum	**859.3517**	**46.4478**	**31.4390**	**0.0640**	**49.8927**	**2.1987**	**51.8795**	**9.9840**	**2.0228**	**12.0069**	**0.0000**	**6,206.2099**	**6,206.2099**	**1.9481**	**0.0000**	**6,254.8865**

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1546	42.4652	22.0582	0.0399	18.2675	2.1987	20.4662	9.9840	2.0228	12.0069	0.0000	3,870.7934	3,870.7934	1.1961	0.0000	3,900.6952
2021	4.2729	46.4478	31.4390	0.0640	49.8927	2.0458	51.8795	9.9840	1.8821	11.8661	0.0000	6,206.2099	6,206.2099	1.9471	0.0000	6,254.8865
2022	3.7023	38.8870	29.5639	0.0640	49.8927	1.6363	51.5291	8.0824	1.5054	9.5878	0.0000	6,203.2063	6,203.2063	1.9481	0.0000	6,251.9084
2023	2.4410	19.3067	22.7652	0.0610	2.6588	0.7194	3.3782	0.7149	0.6768	1.3917	0.0000	6,102.6080	6,102.6080	0.7771	0.0000	6,122.0363
2024	2.3012	18.2743	22.3128	0.0601	2.6588	0.6326	3.2914	0.7149	0.5949	1.3098	0.0000	6,017.0064	6,017.0064	0.7682	0.0000	6,036.2101
2025	2.1644	17.2128	21.9078	0.0593	2.6588	0.5466	3.2053	0.7149	0.5139	1.2289	0.0000	5,936.3657	5,936.3657	0.7601	0.0000	5,955.3677
2026	2.1362	17.1299	21.6349	0.0586	2.6588	0.5460	3.2048	0.7149	0.5134	1.2283	0.0000	5,865.4045	5,865.4045	0.7559	0.0000	5,884.3007
2027	2.1084	17.0521	21.3966	0.0580	2.6588	0.5452	3.2040	0.7149	0.5127	1.2276	0.0000	5,803.1036	5,803.1036	0.7520	0.0000	5,821.9037
2028	2.0794	16.9857	21.1896	0.0574	2.6588	0.5441	3.2029	0.7149	0.5117	1.2266	0.0000	5,748.9939	5,748.9939	0.7486	0.0000	5,767.7084
2029	2.0475	16.9237	20.9930	0.0569	2.6588	0.5432	3.2020	0.7149	0.5108	1.2257	0.0000	5,701.4788	5,701.4788	0.7455	0.0000	5,720.1165
2030	1.9560	12.3307	20.8837	0.0605	2.6588	0.1629	2.8217	0.7149	0.1619	0.8768	0.0000	6,000.7808	6,000.7808	0.2580	0.0000	6,007.2302
2031	1.9190	12.2678	20.7135	0.0601	2.6588	0.1621	2.8209	0.7149	0.1612	0.8761	0.0000	5,961.5257	5,961.5257	0.2555	0.0000	5,967.9130
2032	1.8863	12.2187	20.5621	0.0598	2.6588	0.1614	2.8202	0.7149	0.1605	0.8755	0.0000	5,930.4334	5,930.4334	0.2534	0.0000	5,936.7675
2033	1.8585	12.1741	20.4319	0.0595	2.6588	0.1608	2.8196	0.7149	0.1600	0.8749	0.0000	5,903.6473	5,903.6473	0.2515	0.0000	5,909.9351
2034	1.8345	12.1339	20.3067	0.0593	2.6588	0.1602	2.8190	0.7149	0.1594	0.8743	0.0000	5,880.6796	5,880.6796	0.2498	0.0000	5,886.9255

Lake Forest General Plan Buildout Year (2040) - Orange County, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2035	1.7221	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2036	1.7221	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2037	1.7221	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2038	859.3517	11.3276	20.1609	0.0591	2.6588	0.1020	2.7608	0.7149	0.1012	0.8161	0.0000	5,861.3806	5,861.3806	0.2401	0.0000	5,867.3819
2039	859.3517	0.9226	4.2647	0.0163	2.2244	0.0170	2.2413	0.5899	0.0164	0.6063	0.0000	1,615.7617	1,615.7617	0.0240	0.0000	1,616.3624
2040	859.2780	0.8678	3.9403	0.0158	2.2244	0.0130	2.2373	0.5899	0.0125	0.6024	0.0000	1,565.4714	1,565.4714	0.0210	0.0000	1,565.9952
Maximum	**859.3517**	**46.4478**	**31.4390**	**0.0640**	**49.8927**	**2.1987**	**51.8795**	**9.9840**	**2.0228**	**12.0069**	**0.0000**	**6,206.2099**	**6,206.2099**	**1.9481**	**0.0000**	**6,254.8865**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425
Energy	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230
Mobile	1,231.0463	5,178.2347	15,739.6228	56.0490	5,021.0924	57.6827	5,078.7752	1,342.6783	54.1273	1,396.8055		5,685,314.5483	5,685,314.5483	249.1708		5,691,543.8175
Total	**3,215.0914**	**5,527.6728**	**20,150.0363**	**58.1606**	**5,021.0924**	**104.9676**	**5,126.0601**	**1,342.6783**	**101.4122**	**1,444.0904**	**0.0000**	**6,070,502.2650**	**6,070,502.2650**	**263.8559**	**6.9219**	**6,079,161.3830**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425
Energy	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230
Mobile	1,231.0463	5,178.2347	15,739.6228	56.0490	5,021.0924	57.6827	5,078.7752	1,342.6783	54.1273	1,396.8055		5,685,314.5483	5,685,314.5483	249.1708		5,691,543.8175
Total	**3,215.0914**	**5,527.6728**	**20,150.0363**	**58.1606**	**5,021.0924**	**104.9676**	**5,126.0601**	**1,342.6783**	**101.4122**	**1,444.0904**	**0.0000**	**6,070,502.2650**	**6,070,502.2650**	**263.8559**	**6.9219**	**6,079,161.3830**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2020	6/1/2021	5	262	
2	Grading	Grading	6/2/2021	6/1/2022	5	261	
3	Building Construction	Building Construction	6/2/2023	6/1/2038	5	3913	
4	Paving	Paving	6/2/2022	6/1/2023	5	261	
5	Architectural Coating	Architectural Coating	6/2/2038	12/31/2040	5	674	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10742

Acres of Paving: 0

Residential Indoor: 131,528,610; Residential Outdoor: 43,842,870; Non-Residential Indoor: 27,902,051; Non-Residential Outdoor: 9,300,684; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Lake Forest General Plan Buildout Year (2040) - Orange County, Winter

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	199.00	68.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	199.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0782	0.0479	0.5446	1.8600e-003	0.2012	1.3300e-003	0.2025	0.0534	1.2300e-003	0.0546		185.6918	185.6918	4.2400e-003		185.7977
Total	**0.0782**	**0.0479**	**0.5446**	**1.8600e-003**	**0.2012**	**1.3300e-003**	**0.2025**	**0.0534**	**1.2300e-003**	**0.0546**		**185.6918**	**185.6918**	**4.2400e-003**		**185.7977**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0782	0.0479	0.5446	1.8600e-003	0.2012	1.3300e-003	0.2025	0.0534	1.2300e-003	0.0546		185.6918	185.6918	4.2400e-003		185.7977
Total	**0.0782**	**0.0479**	**0.5446**	**1.8600e-003**	**0.2012**	**1.3300e-003**	**0.2025**	**0.0534**	**1.2300e-003**	**0.0546**		**185.6918**	**185.6918**	**4.2400e-003**		**185.7977**

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0736	0.0432	0.5045	1.8000e-003	0.2012	1.3000e-003	0.2025	0.0534	1.2000e-003	0.0546		179.2498	179.2498	3.8400e-003		179.3458
Total	**0.0736**	**0.0432**	**0.5045**	**1.8000e-003**	**0.2012**	**1.3000e-003**	**0.2025**	**0.0534**	**1.2000e-003**	**0.0546**		**179.2498**	**179.2498**	**3.8400e-003**		**179.3458**

3.2 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0736	0.0432	0.5045	1.8000e-003	0.2012	1.3000e-003	0.2025	0.0534	1.2000e-003	0.0546		179.2498	179.2498	3.8400e-003		179.3458
Total	**0.0736**	**0.0432**	**0.5045**	**1.8000e-003**	**0.2012**	**1.3000e-003**	**0.2025**	**0.0534**	**1.2000e-003**	**0.0546**		**179.2498**	**179.2498**	**3.8400e-003**		**179.3458**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**49.6692**	**1.9853**	**51.6545**	**8.0231**	**1.8265**	**9.8496**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0817	0.0480	0.5605	2.0000e-003	0.2236	1.4500e-003	0.2250	0.0593	1.3300e-003	0.0606		199.1664	199.1664	4.2600e-003		199.2731
Total	**0.0817**	**0.0480**	**0.5605**	**2.0000e-003**	**0.2236**	**1.4500e-003**	**0.2250**	**0.0593**	**1.3300e-003**	**0.0606**		**199.1664**	**199.1664**	**4.2600e-003**		**199.2731**

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**49.6692**	**1.9853**	**51.6545**	**8.0231**	**1.8265**	**9.8496**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0817	0.0480	0.5605	2.0000e-003	0.2236	1.4500e-003	0.2250	0.0593	1.3300e-003	0.0606		199.1664	199.1664	4.2600e-003		199.2731
Total	**0.0817**	**0.0480**	**0.5605**	**2.0000e-003**	**0.2236**	**1.4500e-003**	**0.2250**	**0.0593**	**1.3300e-003**	**0.0606**		**199.1664**	**199.1664**	**4.2600e-003**		**199.2731**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041		6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**49.6692**	**1.6349**	**51.3041**	**8.0231**	**1.5041**	**9.5272**		**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0774	0.0435	0.5224	1.9200e-003	0.2236	1.4200e-003	0.2250	0.0593	1.3100e-003	0.0606		191.7958	191.7958	3.8700e-003		191.8925
Total	**0.0774**	**0.0435**	**0.5224**	**1.9200e-003**	**0.2236**	**1.4200e-003**	**0.2250**	**0.0593**	**1.3100e-003**	**0.0606**		**191.7958**	**191.7958**	**3.8700e-003**		**191.8925**

3.3 Grading - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					49.6692	0.0000	49.6692	8.0231	0.0000	8.0231			0.0000			0.0000
Off-Road	3.6248	38.8435	29.0415	0.0621		1.6349	1.6349		1.5041	1.5041	0.0000	6,011.4105	6,011.4105	1.9442		6,060.0158
Total	**3.6248**	**38.8435**	**29.0415**	**0.0621**	**49.6692**	**1.6349**	**51.3041**	**8.0231**	**1.5041**	**9.5272**	**0.0000**	**6,011.4105**	**6,011.4105**	**1.9442**		**6,060.0158**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0774	0.0435	0.5224	1.9200e-003	0.2236	1.4200e-003	0.2250	0.0593	1.3100e-003	0.0606		191.7958	191.7958	3.8700e-003		191.8925
Total	**0.0774**	**0.0435**	**0.5224**	**1.9200e-003**	**0.2236**	**1.4200e-003**	**0.2250**	**0.0593**	**1.3100e-003**	**0.0606**		**191.7958**	**191.7958**	**3.8700e-003**		**191.8925**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1364	4.5291	1.6817	0.0157	0.4344	5.8200e-003	0.4403	0.1250	5.5700e-003	0.1306		1,712.3029	1,712.3029	0.1344		1,715.6626
Worker	0.7319	0.3927	4.8395	0.0184	2.2244	0.0139	2.2382	0.5899	0.0128	0.6027		1,835.0952	1,835.0952	0.0349		1,835.9676
Total	**0.8683**	**4.9218**	**6.5212**	**0.0341**	**2.6588**	**0.0197**	**2.6785**	**0.7149**	**0.0183**	**0.7333**		**3,547.3981**	**3,547.3981**	**0.1693**		**3,551.6302**

3.4 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1364	4.5291	1.6817	0.0157	0.4344	5.8200e-003	0.4403	0.1250	5.5700e-003	0.1306		1,712.3029	1,712.3029	0.1344		1,715.6626
Worker	0.7319	0.3927	4.8395	0.0184	2.2244	0.0139	2.2382	0.5899	0.0128	0.6027		1,835.0952	1,835.0952	0.0349		1,835.9676
Total	**0.8683**	**4.9218**	**6.5212**	**0.0341**	**2.6588**	**0.0197**	**2.6785**	**0.7149**	**0.0183**	**0.7333**		**3,547.3981**	**3,547.3981**	**0.1693**		**3,551.6302**

3.4 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769		2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**		**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1317	4.4730	1.6457	0.0155	0.4344	5.6700e-003	0.4401	0.1250	5.4200e-003	0.1304		1,698.9116	1,698.9116	0.1321		1,702.2151
Worker	0.6979	0.3575	4.5003	0.0177	2.2244	0.0136	2.2380	0.5899	0.0126	0.6025		1,762.3959	1,762.3959	0.0317		1,763.1874
Total	**0.8296**	**4.8305**	**6.1460**	**0.0332**	**2.6588**	**0.0193**	**2.6781**	**0.7149**	**0.0180**	**0.7329**		**3,461.3075**	**3,461.3075**	**0.1638**		**3,465.4025**

3.4 Building Construction - 2024

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.4716	13.4438	16.1668	0.0270		0.6133	0.6133		0.5769	0.5769	0.0000	2,555.6989	2,555.6989	0.6044		2,570.8077
Total	**1.4716**	**13.4438**	**16.1668**	**0.0270**		**0.6133**	**0.6133**		**0.5769**	**0.5769**	**0.0000**	**2,555.6989**	**2,555.6989**	**0.6044**		**2,570.8077**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1317	4.4730	1.6457	0.0155	0.4344	5.6700e-003	0.4401	0.1250	5.4200e-003	0.1304		1,698.9116	1,698.9116	0.1321		1,702.2151
Worker	0.6979	0.3575	4.5003	0.0177	2.2244	0.0136	2.2380	0.5899	0.0126	0.6025		1,762.3959	1,762.3959	0.0317		1,763.1874
Total	**0.8296**	**4.8305**	**6.1460**	**0.0332**	**2.6588**	**0.0193**	**2.6781**	**0.7149**	**0.0180**	**0.7329**		**3,461.3075**	**3,461.3075**	**0.1638**		**3,465.4025**

3.4 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1283	4.4153	1.6249	0.0154	0.4344	5.5300e-003	0.4400	0.1250	5.2800e-003	0.1303		1,688.6735	1,688.6735	0.1302		1,691.9283
Worker	0.6687	0.3279	4.1982	0.0170	2.2244	0.0135	2.2378	0.5899	0.0124	0.6023		1,691.2178	1,691.2178	0.0289		1,691.9413
Total	**0.7970**	**4.7432**	**5.8231**	**0.0324**	**2.6588**	**0.0190**	**2.6778**	**0.7149**	**0.0177**	**0.7326**		**3,379.8913**	**3,379.8913**	**0.1591**		**3,383.8697**

3.4 Building Construction - 2025

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1283	4.4153	1.6249	0.0154	0.4344	5.5300e-003	0.4400	0.1250	5.2800e-003	0.1303		1,688.6735	1,688.6735	0.1302		1,691.9283
Worker	0.6687	0.3279	4.1982	0.0170	2.2244	0.0135	2.2378	0.5899	0.0124	0.6023		1,691.2178	1,691.2178	0.0289		1,691.9413
Total	**0.7970**	**4.7432**	**5.8231**	**0.0324**	**2.6588**	**0.0190**	**2.6778**	**0.7149**	**0.0177**	**0.7326**		**3,379.8913**	**3,379.8913**	**0.1591**		**3,383.8697**

3.4 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1252	4.3575	1.6106	0.0153	0.4344	5.3800e-003	0.4398	0.1250	5.1400e-003	0.1302		1,678.8439	1,678.8439	0.1283		1,682.0516
Worker	0.6436	0.3027	3.9396	0.0163	2.2244	0.0131	2.2374	0.5899	0.0120	0.6019		1,630.0862	1,630.0862	0.0266		1,630.7510
Total	**0.7688**	**4.6602**	**5.5502**	**0.0316**	**2.6588**	**0.0185**	**2.6772**	**0.7149**	**0.0172**	**0.7321**		**3,308.9301**	**3,308.9301**	**0.1549**		**3,312.8026**

3.4 Building Construction - 2026

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1252	4.3575	1.6106	0.0153	0.4344	5.3800e-003	0.4398	0.1250	5.1400e-003	0.1302		1,678.8439	1,678.8439	0.1283		1,682.0516
Worker	0.6436	0.3027	3.9396	0.0163	2.2244	0.0131	2.2374	0.5899	0.0120	0.6019		1,630.0862	1,630.0862	0.0266		1,630.7510
Total	**0.7688**	**4.6602**	**5.5502**	**0.0316**	**2.6588**	**0.0185**	**2.6772**	**0.7149**	**0.0172**	**0.7321**		**3,308.9301**	**3,308.9301**	**0.1549**		**3,312.8026**

3.4 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1226	4.3020	1.5992	0.0152	0.4344	5.2500e-003	0.4397	0.1250	5.0200e-003	0.1300		1,669.7645	1,669.7645	0.1266		1,672.9281
Worker	0.6184	0.2804	3.7128	0.0158	2.2244	0.0124	2.2367	0.5899	0.0114	0.6013		1,576.8647	1,576.8647	0.0245		1,577.4775
Total	**0.7410**	**4.5824**	**5.3120**	**0.0310**	**2.6588**	**0.0176**	**2.6764**	**0.7149**	**0.0164**	**0.7313**		**3,246.6292**	**3,246.6292**	**0.1511**		**3,250.4057**

3.4 Building Construction - 2027

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1226	4.3020	1.5992	0.0152	0.4344	5.2500e-003	0.4397	0.1250	5.0200e-003	0.1300		1,669.7645	1,669.7645	0.1266		1,672.9281
Worker	0.6184	0.2804	3.7128	0.0158	2.2244	0.0124	2.2367	0.5899	0.0114	0.6013		1,576.8647	1,576.8647	0.0245		1,577.4775
Total	**0.7410**	**4.5824**	**5.3120**	**0.0310**	**2.6588**	**0.0176**	**2.6764**	**0.7149**	**0.0164**	**0.7313**		**3,246.6292**	**3,246.6292**	**0.1511**		**3,250.4057**

3.4 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1204	4.2555	1.5923	0.0151	0.4344	5.1300e-003	0.4396	0.1250	4.9000e-003	0.1299		1,661.9177	1,661.9177	0.1249		1,665.0411
Worker	0.5916	0.2605	3.5127	0.0153	2.2244	0.0114	2.2358	0.5899	0.0105	0.6004		1,530.6018	1,530.6018	0.0227		1,531.1692
Total	**0.7120**	**4.5160**	**5.1050**	**0.0305**	**2.6588**	**0.0166**	**2.6753**	**0.7149**	**0.0154**	**0.7303**		**3,192.5196**	**3,192.5196**	**0.1476**		**3,196.2103**

3.4 Building Construction - 2028

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1204	4.2555	1.5923	0.0151	0.4344	5.1300e-003	0.4396	0.1250	4.9000e-003	0.1299		1,661.9177	1,661.9177	0.1249		1,665.0411
Worker	0.5916	0.2605	3.5127	0.0153	2.2244	0.0114	2.2358	0.5899	0.0105	0.6004		1,530.6018	1,530.6018	0.0227		1,531.1692
Total	**0.7120**	**4.5160**	**5.1050**	**0.0305**	**2.6588**	**0.0166**	**2.6753**	**0.7149**	**0.0154**	**0.7303**		**3,192.5196**	**3,192.5196**	**0.1476**		**3,196.2103**

3.4 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963		2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**		**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1185	4.2119	1.5856	0.0151	0.4344	5.0200e-003	0.4395	0.1250	4.8000e-003	0.1298		1,654.8076	1,654.8076	0.1236		1,657.8969
Worker	0.5616	0.2421	3.3228	0.0149	2.2244	0.0106	2.2349	0.5899	9.7400e-003	0.5997		1,490.1968	1,490.1968	0.0210		1,490.7215
Total	**0.6801**	**4.4540**	**4.9084**	**0.0300**	**2.6588**	**0.0156**	**2.6744**	**0.7149**	**0.0145**	**0.7295**		**3,145.0044**	**3,145.0044**	**0.1446**		**3,148.6184**

3.4 Building Construction - 2029

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3674	12.4697	16.0847	0.0270		0.5276	0.5276		0.4963	0.4963	0.0000	2,556.4744	2,556.4744	0.6010		2,571.4981
Total	**1.3674**	**12.4697**	**16.0847**	**0.0270**		**0.5276**	**0.5276**		**0.4963**	**0.4963**	**0.0000**	**2,556.4744**	**2,556.4744**	**0.6010**		**2,571.4981**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1185	4.2119	1.5856	0.0151	0.4344	5.0200e-003	0.4395	0.1250	4.8000e-003	0.1298		1,654.8076	1,654.8076	0.1236		1,657.8969
Worker	0.5616	0.2421	3.3228	0.0149	2.2244	0.0106	2.2349	0.5899	9.7400e-003	0.5997		1,490.1968	1,490.1968	0.0210		1,490.7215
Total	**0.6801**	**4.4540**	**4.9084**	**0.0300**	**2.6588**	**0.0156**	**2.6744**	**0.7149**	**0.0145**	**0.7295**		**3,145.0044**	**3,145.0044**	**0.1446**		**3,148.6184**

3.4 Building Construction - 2030

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1166	4.1709	1.5795	0.0150	0.4344	4.9100e-003	0.4393	0.1250	4.6900e-003	0.1297		1,648.3665	1,648.3665	0.1223		1,651.4241
Worker	0.5302	0.2251	3.1472	0.0146	2.2244	9.8400e-003	2.2342	0.5899	9.0500e-003	0.5990		1,454.8676	1,454.8676	0.0194		1,455.3533
Total	**0.6468**	**4.3961**	**4.7267**	**0.0296**	**2.6588**	**0.0148**	**2.6735**	**0.7149**	**0.0137**	**0.7287**		**3,103.2340**	**3,103.2340**	**0.1417**		**3,106.7774**

3.4 Building Construction - 2030

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1166	4.1709	1.5795	0.0150	0.4344	4.9100e-003	0.4393	0.1250	4.6900e-003	0.1297		1,648.3665	1,648.3665	0.1223		1,651.4241
Worker	0.5302	0.2251	3.1472	0.0146	2.2244	9.8400e-003	2.2342	0.5899	9.0500e-003	0.5990		1,454.8676	1,454.8676	0.0194		1,455.3533
Total	**0.6468**	**4.3961**	**4.7267**	**0.0296**	**2.6588**	**0.0148**	**2.6735**	**0.7149**	**0.0137**	**0.7287**		**3,103.2340**	**3,103.2340**	**0.1417**		**3,106.7774**

3.4 Building Construction - 2031

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1151	4.1245	1.5770	0.0149	0.4344	4.8200e-003	0.4393	0.1250	4.6100e-003	0.1296		1,643.3581	1,643.3581	0.1214		1,646.3921
Worker	0.4947	0.2086	2.9795	0.0142	2.2244	9.1400e-003	2.2335	0.5899	8.4100e-003	0.5983		1,420.6209	1,420.6209	0.0179		1,421.0680
Total	**0.6099**	**4.3331**	**4.5566**	**0.0292**	**2.6588**	**0.0140**	**2.6728**	**0.7149**	**0.0130**	**0.7279**		**3,063.9790**	**3,063.9790**	**0.1393**		**3,067.4601**

3.4 Building Construction - 2031

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1151	4.1245	1.5770	0.0149	0.4344	4.8200e-003	0.4393	0.1250	4.6100e-003	0.1296		1,643.3581	1,643.3581	0.1214		1,646.3921
Worker	0.4947	0.2086	2.9795	0.0142	2.2244	9.1400e-003	2.2335	0.5899	8.4100e-003	0.5983		1,420.6209	1,420.6209	0.0179		1,421.0680
Total	**0.6099**	**4.3331**	**4.5566**	**0.0292**	**2.6588**	**0.0140**	**2.6728**	**0.7149**	**0.0130**	**0.7279**		**3,063.9790**	**3,063.9790**	**0.1393**		**3,067.4601**

3.4 Building Construction - 2032

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1139	4.0895	1.5762	0.0149	0.4344	4.7400e-003	0.4392	0.1250	4.5300e-003	0.1296		1,638.9605	1,638.9605	0.1205		1,641.9733
Worker	0.4633	0.1946	2.8290	0.0140	2.2244	8.5400e-003	2.2329	0.5899	7.8500e-003	0.5978		1,393.9262	1,393.9262	0.0166		1,394.3413
Total	**0.5772**	**4.2841**	**4.4051**	**0.0288**	**2.6588**	**0.0133**	**2.6721**	**0.7149**	**0.0124**	**0.7273**		**3,032.8867**	**3,032.8867**	**0.1371**		**3,036.3146**

3.4 Building Construction - 2032

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1139	4.0895	1.5762	0.0149	0.4344	4.7400e-003	0.4392	0.1250	4.5300e-003	0.1296		1,638.9605	1,638.9605	0.1205		1,641.9733
Worker	0.4633	0.1946	2.8290	0.0140	2.2244	8.5400e-003	2.2329	0.5899	7.8500e-003	0.5978		1,393.9262	1,393.9262	0.0166		1,394.3413
Total	**0.5772**	**4.2841**	**4.4051**	**0.0288**	**2.6588**	**0.0133**	**2.6721**	**0.7149**	**0.0124**	**0.7273**		**3,032.8867**	**3,032.8867**	**0.1371**		**3,036.3146**

3.4 Building Construction - 2033

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1130	4.0569	1.5765	0.0148	0.4344	4.6700e-003	0.4391	0.1250	4.4600e-003	0.1295		1,635.1725	1,635.1725	0.1198		1,638.1665
Worker	0.4364	0.1826	2.6984	0.0137	2.2244	8.0000e-003	2.2324	0.5899	7.3600e-003	0.5973		1,370.9280	1,370.9280	0.0155		1,371.3157
Total	**0.5493**	**4.2395**	**4.2749**	**0.0286**	**2.6588**	**0.0127**	**2.6715**	**0.7149**	**0.0118**	**0.7267**		**3,006.1005**	**3,006.1005**	**0.1353**		**3,009.4822**

3.4 Building Construction - 2033

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1130	4.0569	1.5765	0.0148	0.4344	4.6700e-003	0.4391	0.1250	4.4600e-003	0.1295		1,635.1725	1,635.1725	0.1198		1,638.1665
Worker	0.4364	0.1826	2.6984	0.0137	2.2244	8.0000e-003	2.2324	0.5899	7.3600e-003	0.5973		1,370.9280	1,370.9280	0.0155		1,371.3157
Total	**0.5493**	**4.2395**	**4.2749**	**0.0286**	**2.6588**	**0.0127**	**2.6715**	**0.7149**	**0.0118**	**0.7267**		**3,006.1005**	**3,006.1005**	**0.1353**		**3,009.4822**

3.4 Building Construction - 2034

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481		2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**		**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1121	4.0267	1.5751	0.0148	0.4344	4.5800e-003	0.4390	0.1250	4.3800e-003	0.1294		1,632.0273	1,632.0273	0.1191		1,635.0051
Worker	0.4133	0.1725	2.5746	0.0135	2.2244	7.5000e-003	2.2319	0.5899	6.8900e-003	0.5968		1,351.1056	1,351.1056	0.0145		1,351.4676
Total	**0.5254**	**4.1992**	**4.1497**	**0.0283**	**2.6588**	**0.0121**	**2.6709**	**0.7149**	**0.0113**	**0.7262**		**2,983.1329**	**2,983.1329**	**0.1336**		**2,986.4726**

3.4 Building Construction - 2034

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3091	7.9346	16.1570	0.0310		0.1481	0.1481		0.1481	0.1481	0.0000	2,897.5468	2,897.5468	0.1162		2,900.4529
Total	**1.3091**	**7.9346**	**16.1570**	**0.0310**		**0.1481**	**0.1481**		**0.1481**	**0.1481**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1162**		**2,900.4529**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1121	4.0267	1.5751	0.0148	0.4344	4.5800e-003	0.4390	0.1250	4.3800e-003	0.1294		1,632.0273	1,632.0273	0.1191		1,635.0051
Worker	0.4133	0.1725	2.5746	0.0135	2.2244	7.5000e-003	2.2319	0.5899	6.8900e-003	0.5968		1,351.1056	1,351.1056	0.0145		1,351.4676
Total	**0.5254**	**4.1992**	**4.1497**	**0.0283**	**2.6588**	**0.0121**	**2.6709**	**0.7149**	**0.0113**	**0.7262**		**2,983.1329**	**2,983.1329**	**0.1336**		**2,986.4726**

3.4 Building Construction - 2035

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.4 Building Construction - 2035

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.4 Building Construction - 2036

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.4 Building Construction - 2036

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.4 Building Construction - 2037

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.4 Building Construction - 2037

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.4 Building Construction - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904		2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**		**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.4 Building Construction - 2038

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2168	7.1613	16.1178	0.0310		0.0904	0.0904		0.0904	0.0904	0.0000	2,897.5468	2,897.5468	0.1079		2,900.2448
Total	**1.2168**	**7.1613**	**16.1178**	**0.0310**		**0.0904**	**0.0904**		**0.0904**	**0.0904**	**0.0000**	**2,897.5468**	**2,897.5468**	**0.1079**		**2,900.2448**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1113	4.0015	1.5728	0.0148	0.4344	4.5100e-003	0.4390	0.1250	4.3100e-003	0.1293		1,629.5202	1,629.5202	0.1185		1,632.4828
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.5053**	**4.1663**	**4.0432**	**0.0281**	**2.6588**	**0.0116**	**2.6704**	**0.7149**	**0.0108**	**0.7257**		**2,963.8338**	**2,963.8338**	**0.1321**		**2,967.1372**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0581	0.0326	0.3918	1.4400e-003	0.1677	1.0600e-003	0.1687	0.0445	9.8000e-004	0.0455		143.8468	143.8468	2.9000e-003		143.9194
Total	**0.0581**	**0.0326**	**0.3918**	**1.4400e-003**	**0.1677**	**1.0600e-003**	**0.1687**	**0.0445**	**9.8000e-004**	**0.0455**		**143.8468**	**143.8468**	**2.9000e-003**		**143.9194**

3.5 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0581	0.0326	0.3918	1.4400e-003	0.1677	1.0600e-003	0.1687	0.0445	9.8000e-004	0.0455		143.8468	143.8468	2.9000e-003		143.9194
Total	**0.0581**	**0.0326**	**0.3918**	**1.4400e-003**	**0.1677**	**1.0600e-003**	**0.1687**	**0.0445**	**9.8000e-004**	**0.0455**		**143.8468**	**143.8468**	**2.9000e-003**		**143.9194**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0296	0.3648	1.3900e-003	0.1677	1.0500e-003	0.1687	0.0445	9.6000e-004	0.0454		138.3238	138.3238	2.6300e-003		138.3895
Total	**0.0552**	**0.0296**	**0.3648**	**1.3900e-003**	**0.1677**	**1.0500e-003**	**0.1687**	**0.0445**	**9.6000e-004**	**0.0454**		**138.3238**	**138.3238**	**2.6300e-003**		**138.3895**

3.5 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0552	0.0296	0.3648	1.3900e-003	0.1677	1.0500e-003	0.1687	0.0445	9.6000e-004	0.0454		138.3238	138.3238	2.6300e-003		138.3895
Total	**0.0552**	**0.0296**	**0.3648**	**1.3900e-003**	**0.1677**	**1.0500e-003**	**0.1687**	**0.0445**	**9.6000e-004**	**0.0454**		**138.3238**	**138.3238**	**2.6300e-003**		**138.3895**

3.6 Architectural Coating - 2038

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003		281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**		**281.4481**	**281.4481**	**0.0104**		**281.7081**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.3940**	**0.1648**	**2.4704**	**0.0134**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,334.3137**	**1,334.3137**	**0.0136**		**1,334.6543**

3.6 Architectural Coating - 2038

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003	0.0000	281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0104**		**281.7081**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.3940**	**0.1648**	**2.4704**	**0.0134**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,334.3137**	**1,334.3137**	**0.0136**		**1,334.6543**

3.6 Architectural Coating - 2039

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003		281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**		**281.4481**	**281.4481**	**0.0104**		**281.7081**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.3940**	**0.1648**	**2.4704**	**0.0134**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,334.3137**	**1,334.3137**	**0.0136**		**1,334.6543**

3.6 Architectural Coating - 2039

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1179	0.7577	1.7943	2.9700e-003		9.9000e-003	9.9000e-003		9.9000e-003	9.9000e-003	0.0000	281.4481	281.4481	0.0104		281.7081
Total	**858.9578**	**0.7577**	**1.7943**	**2.9700e-003**		**9.9000e-003**	**9.9000e-003**		**9.9000e-003**	**9.9000e-003**	**0.0000**	**281.4481**	**281.4481**	**0.0104**		**281.7081**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3940	0.1648	2.4704	0.0134	2.2244	7.0500e-003	2.2314	0.5899	6.4800e-003	0.5964		1,334.3137	1,334.3137	0.0136		1,334.6543
Total	**0.3940**	**0.1648**	**2.4704**	**0.0134**	**2.2244**	**7.0500e-003**	**2.2314**	**0.5899**	**6.4800e-003**	**0.5964**		**1,334.3137**	**1,334.3137**	**0.0136**		**1,334.6543**

3.6 Architectural Coating - 2040

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003		281.4481	281.4481	9.9000e-003		281.6957
Total	**858.9548**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**		**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3232	0.1408	2.1480	0.0129	2.2244	5.5400e-003	2.2299	0.5899	5.1000e-003	0.5950		1,284.0233	1,284.0233	0.0111		1,284.2996
Total	**0.3232**	**0.1408**	**2.1480**	**0.0129**	**2.2244**	**5.5400e-003**	**2.2299**	**0.5899**	**5.1000e-003**	**0.5950**		**1,284.0233**	**1,284.0233**	**0.0111**		**1,284.2996**

3.6 Architectural Coating - 2040

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	858.8399					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1149	0.7270	1.7923	2.9700e-003		7.4300e-003	7.4300e-003		7.4300e-003	7.4300e-003	0.0000	281.4481	281.4481	9.9000e-003		281.6957
Total	**858.9548**	**0.7270**	**1.7923**	**2.9700e-003**		**7.4300e-003**	**7.4300e-003**		**7.4300e-003**	**7.4300e-003**	**0.0000**	**281.4481**	**281.4481**	**9.9000e-003**		**281.6957**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3232	0.1408	2.1480	0.0129	2.2244	5.5400e-003	2.2299	0.5899	5.1000e-003	0.5950		1,284.0233	1,284.0233	0.0111		1,284.2996
Total	**0.3232**	**0.1408**	**2.1480**	**0.0129**	**2.2244**	**5.5400e-003**	**2.2299**	**0.5899**	**5.1000e-003**	**0.5950**		**1,284.0233**	**1,284.0233**	**0.0111**		**1,284.2996**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1,231.0463	5,178.2347	15,739.6228	56.0490	5,021.0924	57.6827	5,078.7752	1,342.6783	54.1273	1,396.8055		5,685,314.5483	5,685,314.5483	249.1708		5,691,543.8175
Unmitigated	1,231.0463	5,178.2347	15,739.6228	56.0490	5,021.0924	57.6827	5,078.7752	1,342.6783	54.1273	1,396.8055		5,685,314.5483	5,685,314.5483	249.1708		5,691,543.8175

4.2 Trip Summary Information

Lake Forest General Plan Buildout Year (2040) - Orange County, Winter

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	2,604.00	3,087.60	2263.00	8,967,876	8,967,876
Apartments High Rise	13,713.00	16,259.70	11917.25	47,225,991	47,225,991
Apartments High Rise	3,990.00	4,731.00	3467.50	13,741,100	13,741,100
Apartments Mid Rise	52,741.15	50,679.09	46475.66	176,159,307	176,159,307
Apartments Mid Rise	21,506.10	20,665.26	18951.24	71,831,951	71,831,951
Apartments Mid Rise	50,320.55	48,353.13	44342.62	168,074,326	168,074,326
Apartments Mid Rise	7,680.75	7,380.45	6768.30	25,654,268	25,654,268
Condo/Townhouse	55,712.09	54,369.63	46410.76	185,180,754	185,180,754
Single Family Housing	162,058.96	168,697.93	146738.26	549,541,973	549,541,973
General Office Building	1,217.71	271.58	115.92	2,980,341	2,980,341
General Office Building	5,666.28	1,263.74	539.40	13,868,169	13,868,169
Office Park	51,913.26	7,455.14	3454.82	130,549,274	130,549,274
Strip Mall	135,367.91	128,404.03	62399.96	235,824,920	235,824,920
General Light Industry	66,672.25	12,626.59	6504.61	222,990,616	222,990,616
Library	45,639.15	37,775.65	20685.31	103,388,312	103,388,312
City Park	470.61	5,664.75	4168.26	5,009,411	5,009,411
City Park	3,664.71	44,112.25	32458.86	39,009,027	39,009,027
City Park	1,657.53	19,951.75	14680.98	17,643,588	17,643,588
Total	682,596.01	631,749.29	472,342.72	2,017,641,204	2,017,641,204

4.3 Trip Type Information

Lake Forest General Plan Buildout Year (2040) - Orange County, Winter

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments High Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Apartments Mid Rise	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Condo/Townhouse	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
General Office Building	16.60	8.40	6.90	33.00	48.00	19.00	77	19	4
Office Park	16.60	8.40	6.90	33.00	48.00	19.00	82	15	3
Strip Mall	16.60	8.40	6.90	16.60	64.40	19.00	45	40	15
General Light Industry	16.60	8.40	6.90	59.00	28.00	13.00	92	5	3
Library	16.60	8.40	6.90	52.00	43.00	5.00	44	44	12
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Apartments Mid Rise	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Condo/Townhouse	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Single Family Housing	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
General Office Building	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Office Park	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Strip Mall	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
General Light Industry	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
Library	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002
City Park	0.555968	0.043848	0.210359	0.116378	0.016765	0.005795	0.025008	0.016160	0.001677	0.001586	0.004867	0.000586	0.001002

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230
NaturalGas Unmitigated	34.6094	300.2718	158.9890	1.8878		23.9120	23.9120		23.9120	23.9120		377,557.1894	377,557.1894	7.2365	6.9219	379,800.8230

5.2 Energy by Land Use - NaturalGas

Unmitigated

Lake Forest General Plan Buildout Year (2040) - Orange County, Winter

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments High Rise	19411	0.2093	1.7889	0.7612	0.0114		0.1446	0.1446		0.1446	0.1446		2,283.6504	2,283.6504	0.0438	0.0419	2,297.2209
Apartments High Rise	29742.7	0.3208	2.7410	1.1664	0.0175		0.2216	0.2216		0.2216	0.2216		3,499.1417	3,499.1417	0.0671	0.0642	3,519.9353
Apartments High Rise	102221	1.1024	9.4204	4.0087	0.0601		0.7617	0.7617		0.7617	0.7617		12,025.9974	12,025.9974	0.2305	0.2205	12,097.4619
Apartments Mid Rise	101250	1.0919	9.3309	3.9706	0.0596		0.7544	0.7544		0.7544	0.7544		11,911.8149	11,911.8149	0.2283	0.2184	11,982.6008
Apartments Mid Rise	236908	2.5549	21.8327	9.2905	0.1394		1.7652	1.7652		1.7652	1.7652		27,871.5842	27,871.5842	0.5342	0.5110	28,037.2110
Apartments Mid Rise	248305	2.6778	22.8830	9.7374	0.1461		1.8501	1.8501		1.8501	1.8501		29,212.3079	29,212.3079	0.5599	0.5356	29,385.9020
Apartments Mid Rise	36160.9	0.3900	3.3325	1.4181	0.0213		0.2694	0.2694		0.2694	0.2694		4,254.2196	4,254.2196	0.0815	0.0780	4,279.5003
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	463572	4.9993	42.7214	18.1793	0.2727		3.4541	3.4541		3.4541	3.4541		54,537.9359	54,537.9359	1.0453	0.9999	54,862.0276
General Light Industry	547729	5.9069	53.6989	45.1071	0.3222		4.0811	4.0811		4.0811	4.0811		64,438.7049	64,438.7049	1.2351	1.1814	64,821.6319
General Office Building	12864	0.1387	1.2612	1.0594	7.5700e-003		0.0959	0.0959		0.0959	0.0959		1,513.4102	1,513.4102	0.0290	0.0278	1,522.4036
General Office Building	2764.49	0.0298	0.2710	0.2277	1.6300e-003		0.0206	0.0206		0.0206	0.0206		325.2338	325.2338	6.2300e-003	5.9600e-003	327.1665
Library	46467.1	0.5011	4.5556	3.8267	0.0273		0.3462	0.3462		0.3462	0.3462		5,466.7192	5,466.7192	0.1048	0.1002	5,499.2052
Office Park	141605	1.5271	13.8829	11.6616	0.0833		1.0551	1.0551		1.0551	1.0551		16,659.4559	16,659.4559	0.3193	0.3054	16,758.4548
Single Family Housing	1.2035e+006	12.9789	110.9107	47.1960	0.7079		8.9672	8.9672		8.9672	8.9672		141,588.0686	141,588.0686	2.7138	2.5958	142,429.4557
Strip Mall	16736	0.1805	1.6408	1.3783	9.8400e-003		0.1247	0.1247		0.1247	0.1247		1,968.9450	1,968.9450	0.0377	0.0361	1,980.6455
Total		**34.6094**	**300.2717**	**158.9890**	**1.8878**		**23.9120**	**23.9120**		**23.9120**	**23.9120**		**377,557.1894**	**377,557.1894**	**7.2365**	**6.9219**	**379,800.8230**

5.2 Energy by Land Use - NaturalGas

Mitigated

Lake Forest General Plan Buildout Year (2040) - Orange County, Winter

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments High Rise	102.221	1.1024	9.4204	4.0087	0.0601		0.7617	0.7617		0.7617	0.7617		12,025.9974	12,025.9974	0.2305	0.2205	12,097.4619
Apartments High Rise	19.411	0.2093	1.7889	0.7612	0.0114		0.1446	0.1446		0.1446	0.1446		2,283.6504	2,283.6504	0.0438	0.0419	2,297.2209
Apartments High Rise	29.7427	0.3208	2.7410	1.1664	0.0175		0.2216	0.2216		0.2216	0.2216		3,499.1417	3,499.1417	0.0671	0.0642	3,519.9353
Apartments Mid Rise	101.25	1.0919	9.3309	3.9706	0.0596		0.7544	0.7544		0.7544	0.7544		11,911.8149	11,911.8149	0.2283	0.2184	11,982.6008
Apartments Mid Rise	236.908	2.5549	21.8327	9.2905	0.1394		1.7652	1.7652		1.7652	1.7652		27,871.5842	27,871.5842	0.5342	0.5110	28,037.2110
Apartments Mid Rise	248.305	2.6778	22.8830	9.7374	0.1461		1.8501	1.8501		1.8501	1.8501		29,212.3079	29,212.3079	0.5599	0.5356	29,385.9020
Apartments Mid Rise	36.1609	0.3900	3.3325	1.4181	0.0213		0.2694	0.2694		0.2694	0.2694		4,254.2196	4,254.2196	0.0815	0.0780	4,279.5003
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	463.572	4.9993	42.7214	18.1793	0.2727		3.4541	3.4541		3.4541	3.4541		54,537.9359	54,537.9359	1.0453	0.9999	54,862.0276
General Light Industry	547.729	5.9069	53.6989	45.1071	0.3222		4.0811	4.0811		4.0811	4.0811		64,438.7049	64,438.7049	1.2351	1.1814	64,821.6319
General Office Building	12.864	0.1387	1.2612	1.0594	7.5700e-003		0.0959	0.0959		0.0959	0.0959		1,513.4102	1,513.4102	0.0290	0.0278	1,522.4036
General Office Building	2.76449	0.0298	0.2710	0.2277	1.6300e-003		0.0206	0.0206		0.0206	0.0206		325.2338	325.2338	6.2300e-003	5.9600e-003	327.1665
Library	46.4671	0.5011	4.5556	3.8267	0.0273		0.3462	0.3462		0.3462	0.3462		5,466.7192	5,466.7192	0.1048	0.1002	5,499.2052
Office Park	141.605	1.5271	13.8829	11.6616	0.0833		1.0551	1.0551		1.0551	1.0551		16,659.4559	16,659.4559	0.3193	0.3054	16,758.4548
Single Family Housing	1203.5	12.9789	110.9107	47.1960	0.7079		8.9672	8.9672		8.9672	8.9672		141,588.0686	141,588.0686	2.7138	2.5958	142,429.4557
Strip Mall	16.736	0.1805	1.6408	1.3783	9.8400e-003		0.1247	0.1247		0.1247	0.1247		1,968.9450	1,968.9450	0.0377	0.0361	1,980.6455
Total		**34.6094**	**300.2717**	**158.9890**	**1.8878**		**23.9120**	**23.9120**		**23.9120**	**23.9120**		**377,557.1894**	**377,557.1894**	**7.2365**	**6.9219**	**379,800.8230**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425
Unmitigated	1,949.4357	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730	0.0000	7,630.5273	7,630.5273	7.4486	0.0000	7,816.7425

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	158.5913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1,661.2431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	129.6013	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730		7,630.5273	7,630.5273	7.4486		7,816.7425
Total	**1,949.4357**	**49.1664**	**4,251.4245**	**0.2238**		**23.3730**	**23.3730**		**23.3730**	**23.3730**	**0.0000**	**7,630.5273**	**7,630.5273**	**7.4486**	**0.0000**	**7,816.7425**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	158.5913					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1,661.2431					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	129.6013	49.1664	4,251.4245	0.2238		23.3730	23.3730		23.3730	23.3730		7,630.5273	7,630.5273	7.4486		7,816.7425
Total	**1,949.4357**	**49.1664**	**4,251.4245**	**0.2238**		**23.3730**	**23.3730**		**23.3730**	**23.3730**	**0.0000**	**7,630.5273**	**7,630.5273**	**7.4486**	**0.0000**	**7,816.7425**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Off-road Mobile (Construction) Energy Usage

Note: For the sake of simplicity, and as a conservative estimation, it was assumed that all off-road vehicles use diesel fuel as an energy source.
Site preparation and grading off-road mobile vehicle on-site gallons of fuel are calculated below.

Given Factor:	**1,149.34**	**metric tons**	**CO2**	**(provided in CalEEMod Output File)**
Conversion Factor:	2204.62	pounds	per metric ton	
Intermediate Result:	**2,533,863**	**pounds**	**CO2**	
Conversion Factor:	22.38	pounds	CO2 per 1 gallon of diesel fuel	(Source: U.S. EIA, 2019).
Final Result:	**113,219.99**	**gallons**	**diesel fuel**	Website: http://www.eia.gov/tools/faqs/faq.cfm?id=307&t=11)

On-road Mobile (Operational) Energy Usage

Note: For the sake of simplicity, it was assumed that passenger vehicles, light duty trucks, motorcycles, and mobile homes use gasoline, and all medium-duty trucks, heavy-duty trucks, and buses use diesel fuel.

Unmitigated:

Step 1: **Average Daily VMT:**

3,958,507

Step 2: Given:

Fleet Mix (provided by CalEEMod v2016.3.2)

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
55.6%	4.4%	21.0%	11.6%	1.7%	0.6%	2.5%	1.6%	0.2%	0.2%	0.5%	0.1%	0.1%

And:

Gasoline MPG Factors for each Vehicle Class (from EMFAC2017) - Year 2040

LDA	LDT1	LDT2	MDV	MCY	MH	OBUS	UBUS
42.47833975	36.227955	36.672969	29.96929692	36.74076401	6.439471274	6.3865722	4.9785029

Diesel MPG Factors for each Vehicle Class (from EMFAC2017) - Year 2040

LHD1	LHD2	MHD	HHD	SBUS
26.4144441	23.761873	12.54155	8.878116218	10.0665604

Therefore:

Weighted Average MPG Factors

Gasoline: **39.1** Diesel: **16.2**

Step 3: **Therefore:**

94,332 daily gallons of gasoline **16,486 daily gallons of diesel**

or

34,431,177 annual gallons of gasoline	**6,017,510 annual gallons of diesel**

On-road Mobile (Construction) Energy Usage - Site Preparation - Phase 1

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

18

Worker Trip Length (miles) (provided by CalEEMod)

14.7

Therefore:

Average Worker Daily VMT:

265

Step 2: Given:

Assumed Fleet Mix for Workers

LDA	LDT1	LDT2
0.3333333	0.3333333	0.3333333

And:

Gasoline MPG Factors for each Vehicle Class (from EMFAC2017) - Year 2020

LDA	LDT1	LDT2
42.47834	36.227955	36.672969

Therefore:

Weighted Average Worker MPG Factor

38.5

Step 3: **Therefore:**

6.9 **Worker daily gallons of gasoline**

Step 4: 262 **# of Days (see CalEEMod)**

Therefore:

Result: **1,803** **Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Grading 1

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

20

Worker Trip Length (miles) (provided by CalEEMod)

14.7

Therefore:

Average Worker Daily VMT:

294

Step 2: Given:

Assumed Fleet Mix for Workers

LDA	LDT1	LDT2
0.3333333	0.3333333	0.3333333

And:

Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2020

LDA	LDT1	LDT2
42.47834	36.227955	36.672969

Therefore:

Weighted Average Worker MPG Factor

38.5

Step 3: **Therefore:**

7.6 **Worker daily gallons of gasoline**

Step 4: 261 **# of Days (see CalEEMod)**

Therefore:

Result: **1,995** **Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Paving 1

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

15

Worker Trip Length (miles) (provided by CalEEMod)

14.7

Therefore:

Average Worker Daily VMT:

221

Step 2: Given:

Assumed Fleet Mix for Workers

LDA	LDT1	LDT2
0.3333333	0.3333333	0.3333333

And:

Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2020

LDA	LDT1	LDT2
42.47834	36.227955	36.672969

Therefore:

Weighted Average Worker MPG Factor

38.5

Step 3: **Therefore:**

5.7 **Worker daily gallons of gasoline**

Step 4: 261 **# of Days (see CalEEMod)**

Therefore:

Result: **1,496** **Total gallons of gasoline**

On-road Mobile (Construction) Energy Usage - Building Construction 1

Step 1:

Total Daily Worker Trips (provided by CalEEMod)
199

Total Daily Vendor Trips (provided by CalEEMod)
68

Total Daily Hauler Trips (provided by CalEEMod)
0

Worker Trip Length (miles) (provided by CalEEMod)
14.7

Vendor Trip Length (miles) (provided by CalEEMod)
6.9

Hauling Trip Length (miles) (provided by CalEEMod)
0

Therefore:

Average Worker Daily VMT:
2,925.30

Average Vendor Daily VMT:
469

Average Hauling Daily VMT:
-

Step 2:

Given:

Assumed Fleet Mix for Workers

LDA	LDT1	LDT2
0.33333333	0.3333333	0.3333333

Assumed Fleet Mix for Vendors

MHD	HHD
0.5	0.5

And:

MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2020

Gasoline:

LDA	LDT1	LDT2
42.4783397	36.227955	36.672969

Diesel:

MHD	HHD
12.54155002	8.8781162

Therefore:

Weighted Average Worker (Gasoline) MPG Factor
38.5

Weighted Average Vendor (Diesel) MPG Factor
10.7

Weighted Average Hauling MPG Factor
0.0

Step 3:

Therefore:
76 **Worker daily gallons of gasoline**

Therefore:
44 **Vendor daily gallons of diesel**

Therefore:
0.0

Step 4:

3913 **# of Days (see CalEEMod)**

Therefore:
297,628 **Total gallons of gasoline**

Therefore:
171,429 **Total gallons of diesel**

On-road Mobile (Construction) Energy Usage - Architectural Coating 1

Step 1: **Total Daily Worker Trips (provided by CalEEMod)**

199

Worker Trip Length (miles) (provided by CalEEMod)

14.7

Therefore:

Average Worker Daily VMT:

2,925

Step 2: Given:

Assumed Fleet Mix for Workers

LDA	LDT1	LDT2
0.3333333	0.3333333	0.3333333

And:

Gasoline MPG Factors for each Vehicle Class (from EMFAC2014) - Year 2020

LDA	LDT1	LDT2
42.47834	36.227955	36.672969

Therefore:

Weighted Average Worker MPG Factor

38.5

Step 3: **Therefore:**

76.1 **Worker daily gallons of gasoline**

Step 4: 674 **# of Days (see CalEEMod)**

Therefore:

Result: **51,265** **Total gallons of gasoline**

EMFAC2017 (v1.0.2) Emissions Inventory
Region Type: County
Region: ORANGE
Calendar Year: 2040
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	VMT	Fuel Consumption		**MPG Factor (Derived)**
ORANGE	2040	All Other Buses	Aggregated	Aggregated	DSL	40267.56	3.105236812		**12.97**
ORANGE	2040	LDA	Aggregated	Aggregated	GAS	52652247	1239.508109		**42.48**
ORANGE	2040	LDA	Aggregated	Aggregated	DSL	653803	10.08528217		**64.83**
ORANGE	2040	LDA	Aggregated	Aggregated	ELEC	3504424	0		
ORANGE	2040	LDT1	Aggregated	Aggregated	GAS	6110029	168.6551034		**36.23**
ORANGE	2040	LDT1	Aggregated	Aggregated	DSL	827.2651	0.02430945		**34.03**
ORANGE	2040	LDT1	Aggregated	Aggregated	ELEC	237054.4	0		
ORANGE	2040	LDT2	Aggregated	Aggregated	GAS	17096889	466.1986518		**36.67**
ORANGE	2040	LDT2	Aggregated	Aggregated	DSL	175287.3	3.605853981		**48.61**
ORANGE	2040	LDT2	Aggregated	Aggregated	ELEC	547642.4	0		
ORANGE	2040	LHD1	Aggregated	Aggregated	GAS	1167778	90.24091498		**12.94**
ORANGE	2040	LHD1	Aggregated	Aggregated	DSL	1322787	50.07816859		**26.41**
ORANGE	2040	LHD2	Aggregated	Aggregated	GAS	206607.2	18.41786512		**11.22**
ORANGE	2040	LHD2	Aggregated	Aggregated	DSL	517672.3	21.78583882		**23.76**
ORANGE	2040	MCY	Aggregated	Aggregated	GAS	478890.3	13.03430357		**36.74**
ORANGE	2040	MDV	Aggregated	Aggregated	GAS	10660563	355.7161676		**29.97**
ORANGE	2040	MDV	Aggregated	Aggregated	DSL	382113	10.23349127		**37.34**
ORANGE	2040	MDV	Aggregated	Aggregated	ELEC	395657.9	0		
ORANGE	2040	MH	Aggregated	Aggregated	GAS	63292.33	9.828808191		**6.44**
ORANGE	2040	MH	Aggregated	Aggregated	DSL	29119.5	2.320180833		**12.55**
ORANGE	2040	Motor Coach	Aggregated	Aggregated	DSL	22762.52	2.684602934		**8.48**
ORANGE	2040	OBUS	Aggregated	Aggregated	GAS	44315.21	6.938809888		**6.39**
ORANGE	2040	PTO	Aggregated	Aggregated	DSL	46381.77	7.229930439		**6.42**
ORANGE	2040	SBUS	Aggregated	Aggregated	GAS	34439.47	3.213103843		**10.72**
ORANGE	2040	SBUS	Aggregated	Aggregated	DSL	39043.12	3.878496407		**10.07**
ORANGE	2040	T6 CAIRP heavy	Aggregated	Aggregated	DSL	23517.26	1.503766466		**15.64**
ORANGE	2040	T6 CAIRP small	Aggregated	Aggregated	DSL	3089.708	0.221448459	**MHD**	
ORANGE	2040	T6 instate construct	Aggregated	Aggregated	DSL	25115	1.995169966		**12.54**
ORANGE	2040	T6 instate construct	Aggregated	Aggregated	DSL	133151.8	9.748968514		
ORANGE	2040	T6 instate heavy	Aggregated	Aggregated	DSL	917923.7	63.19083734		
ORANGE	2040	T6 instate small	Aggregated	Aggregated	DSL	1226308	89.75727559		
ORANGE	2040	T6 OOS heavy	Aggregated	Aggregated	DSL	13324.28	0.851415144		
ORANGE	2040	T6 OOS small	Aggregated	Aggregated	DSL	1870.435	0.134310531		
ORANGE	2040	T6 Public	Aggregated	Aggregated	DSL	12360.52	1.147083033		
ORANGE	2040	T6 utility	Aggregated	Aggregated	DSL	6520.302	0.511431206		
ORANGE	2040	T6TS	Aggregated	Aggregated	GAS	246613	39.03012115		
ORANGE	2040	T7 Ag	Aggregated	Aggregated	DSL	5.305284	0.001155523	**HHD**	
ORANGE	2040	T7 CAIRP	Aggregated	Aggregated	DSL	221007.2	21.50224286		**8.88**
ORANGE	2040	T7 CAIRP constructi	Aggregated	Aggregated	DSL	18040.33	1.790028659		
ORANGE	2040	T7 NNOOS	Aggregated	Aggregated	DSL	269440.2	27.60416499		
ORANGE	2040	T7 NOOS	Aggregated	Aggregated	DSL	86836.12	8.658432978		
ORANGE	2040	T7 POLA	Aggregated	Aggregated	DSL	348244.3	35.41496102		
ORANGE	2040	T7 Public	Aggregated	Aggregated	DSL	23199.93	2.844005366		
ORANGE	2040	T7 Single	Aggregated	Aggregated	DSL	233587.9	26.15688766		
ORANGE	2040	T7 single constructi	Aggregated	Aggregated	DSL	44754.73	4.95455887		
ORANGE	2040	T7 SWCV	Aggregated	Aggregated	DSL	2164.226	1.054709279		
ORANGE	2040	T7 SWCV	Aggregated	Aggregated	NG	67158.55	23.52591724		
ORANGE	2040	T7 tractor	Aggregated	Aggregated	DSL	322326.7	30.86182473		
ORANGE	2040	T7 tractor construct	Aggregated	Aggregated	DSL	36918.71	4.000932283		
ORANGE	2040	T7 utility	Aggregated	Aggregated	DSL	1554.186	0.177286368		
ORANGE	2040	T7IS	Aggregated	Aggregated	GAS	2174.646	0.390846175		
ORANGE	2040	UBUS	Aggregated	Aggregated	GAS	22183.71	4.455899165		**4.98**
ORANGE	2040	UBUS	Aggregated	Aggregated	DSL	0	0		
ORANGE	2040	UBUS	Aggregated	Aggregated	NG	95702.31	24.77659869		**3.86**

Appendix D

Paleontological and Cultural Resources Assessment

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

PALEONTOLOGICAL AND CULTURAL RESOURCES ASSESSMENT FOR THE CITY OF LAKE FOREST GENERAL PLAN UPDATE, CITY OF LAKE FOREST, ORANGE COUNTY, CALIFORNIA

Prepared for:
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Orange, CA 92868

Authors:
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Principal Investigators:
Desireé Martinez, M.A., Principal Archaeologist
Kim Scott, M.S., Principal Paleontologist

Date:
September 2018, revised July 2019

Cogstone Project Number: 4050

Type of Study: Paleontological and Cultural Resources Assessment

USGS 7.5' Quadrangle: El Toro, San Juan Capistrano, Santiago Peak

Area: 10,748.5 acres

Paleontological Localities (rock unit and number of localities): Silverado Formation 18, Santiago Formation 20, Sespe Formation 26, Vaqueros-Sespe Undifferentiated 122, Vaqueros Formation 24, Topanga Group 37, Monterey Formation 31, Puente Formation 32, Capistrano Formation 63, Niguel Formation 4, Niguel Formations/Quaternary Terrace 2, Pleistocene deposits 29

Archaeological Sites: *P-30-000016, P-30-000037, P-30-000038, P-30-000039, P-30-000040, P-30-000042, P-30-000176, P-30-000438 through P-30-000456, P-30-000460, P-30-000489, P-30-000490, P-30-000491, P-30-000510, P-30-000514, P-30-000536, P-30-000544, P-30-000566, P-30-000579, P-30-000594, P-30-000602, P-30-000612, P-30-000628, P-30-000647, P-30-000648, P-30-000693 through P-30-000699, P-30-000739, P-30-000742, P-30-000743, P-30-000741, P-30-000756, P-30-000773, P-30-000825, P-30-000826, P-30-000827, P-30-000828, P-30-000905, P-30-000949, P-30-000950, P-30-000951, P-30-000952, P-30-000953, P-30-000954, P-30-000955, P-30-000957, P-30-000958, P-30-000959, P-30-000960, P-30-001004, P-30-001057, P-30-001058, P-30-001063, P-30-001064, P-30-001066, P-30-001097, P-30-001100, P-30-001145 through P-30-001150, P-30-001171, P-30-001242, P-30-001345, P-30-001362, P-30-001373, P-30-001430, P-30-001496, P-30-001497, P-30-001498, P-30-001500, P-30-001501, P-30-001728, P-30-001741, P-30-100186, P-30-100187, P-30-100188, P-30-100219, P-30-100220, P-30-100276, P-30-100278, P-30-100279, P-30-100280, P-30-100281, P-30-100282, P-30-100283, P-30-100285, P-30-100288, P-30-100289, P-30-100290, P-30-100294, P-30-100295, P-30-100296, P-30-100305, P-30-100309 through P-30-100313, P-30-100371, P-30-100438, P-30-100439, P-30-100444 through P-30-100449, P-30-100453, P-30-100463, P-30-100464, P-30-100491, P-30-156547, P-30-176663*

Key Words: Copious fossils from 50 million to 11 thousand years old, Acjachemen, Tongva, Serrano Adobe, El Toro

TABLE OF CONTENTS

SUMMARY OF FINDINGS ..... **V**

INTRODUCTION **1**

PURPOSE OF STUDY 1
PROJECT LOCATION AND DESCRIPTION 2
PROJECT PERSONNEL 5

REGULATORY ENVIRONMENT **5**

CALIFORNIA REGISTER OF HISTORICAL RESOURCES (PRC § 5024.1) 7
PUBLIC RESOURCES CODE SECTION § 5097.5 8
NATIVE AMERICAN HUMAN REMAINS 8
CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307 8
ATTACHMENT A, CITY OF LAKE FOREST LOCAL GUIDELINES FOR IMPLEMENTING THE CALIFORNIA ENVIRONMENTAL QUALITY ACT 9

BACKGROUND **11**

GEOLOGICAL SETTING 11
PALEONTOLOGICAL SETTING 11
STRATIGRAPHY 11
ETHNOGRAPHY 21
PREHISTORIC SETTING 23
HISTORIC SETTING 26

LITERATURE REVIEW AND RECORD SEARCHES **32**

PALEONTOLOGICAL RECORD AND LITERATURE SEARCHES 32
CALIFORNIA HISTORIC RESOURCES INVENTORY SYSTEM 35
NATIVE AMERICAN CONSULTATION 45

IMPACT ANALYSIS AND MITIGATION **46**

PALEONTOLOGICAL SENSITIVITY 46
CULTURAL SENSITIVITY 52
PROPOSED MITIGATION MEASURES 53

REFERENCES CITED **55**

APPENDIX A. QUALIFICATIONS **58**

APPENDIX B. PALEONTOLOGICAL RECORDS SEARCH RESULTS **63**

APPENDIX C. FOSSIL LOCALITY DATA **70**

APPENDIX D. CULTURAL RESOURCE STUDIES **85**

APPENDIX E. PALEO SENSITIVITY CRITERIA **96**

APPENDIX F. NATIVE AMERICAN CONSULTATION **98**

LIST OF FIGURES

FIGURE 1. PROJECT VICINITY MAP 1
FIGURE 2A. PROJECT LOCATION, MAP 1 OF 2 3
FIGURE 2B. PROJECT LOCATION, MAP 2 OF 2 4
FIGURE 3A. GEOLOGY MAP, 1 OF 2 13
FIGURE 3B. GEOLOGY MAP, 2 OF 2 14
FIGURE 5. ETHNOGRAPHIC TRIBAL BOUNDARIES. 22
FIGURE 6. MEXICAN LAND GRANTS 28
FIGURE 7. 1902 CORONA 15' USGS TOPOGRAPHIC MAP SHOWING HISTORIC CORE AND STAGECOACH STOP. 30
FIGURE 8. 1942 SANTIAGO PEAK 7.5' USGS TOPOGRAPHIC MAP SHOWING HISTORIC CORE. 31
FIGURE 9. HISTORIC CORE OF "OLD EL TORO" SHOWING SVHS PROPOSED RESOURCES. 44
FIGURE 10A. PALEONTOLOGICAL SENSITIVITY OF THE CITY, SOUTHWESTERN HALF. 50
FIGURE 10B. PALEONTOLOGICAL SENSITIVITY OF THE CITY, NORTHEASTERN HALF 51

LIST OF TABLES

TABLE 1. CITY OF LAKE FOREST CADASTRAL INFORMATION 2
TABLE 2. GEOLOGIC UNITS WITHIN THE CITY 12
TABLE 3. CULTURE CHANGE CHRONOLOGY 25
TABLE 4. PREVIOUSLY RECORDED CULTURAL RESOURCES WITHIN THE CITY OF LAKE FOREST 36
TABLE 5. ADDITIONAL SOURCES CONSULTED 42
TABLE 6. BLM GENERAL LAND OFFICE RECORDS 43
TABLE 7. PALEONTOLOGICAL SENSITIVITY RANKINGS 48

SUMMARY OF FINDINGS

The objective of this study is to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Lake Forest (City) to support an update of the City's General Plan. The proposed project is an update to the City of Lake Forest General Plan and is intended to provide guidance for long-term growth, maintenance, preservation, and decision-making in the City over the next 20-plus years. Following its incorporation in 1991, the City of Lake Forest adopted its current General Plan in 1994. Since that time, the City has revised some of its elements to respond to changing circumstances and state legislation (Land Use in 2016, Housing in 2014, Circulation in 2008, and Recreation and Resources in 2015). The General Plan Update is expected to consist of the following elements: Land Use and Community Design; Circulation, Economic Development; Recreation and Resources; Public Safety and Noise; and Public Facilities.

The City has a complicated paleoenvironmental history which began at the age of dinosaurs about 66 million (Ma) years old. The past 66 Ma has seen the City transition from coastal lowlands during the Paleocene to Oligocene, to shallow marine during the early Miocene, to deep marine during the early to early-late Miocene, back to shallow marine in the latest Miocene through the Pliocene, and finally to increasingly arid terrestrial deposits from the Pleistocene to the Holocene. A search for paleontological records was completed by the Natural History Museum of Los Angeles County. Published literature, unpublished paleontological reports, and online databases were also searched for fossil records. Databases included the Natural History Museum of Los Angeles County Invertebrate Paleontology, the Paleobiology Database, and the University of California Museum of Paleontology.

Cogstone conducted a search of the California Historic Resources Inventory System (CHRIS) at the South Central Coastal Information Center (SCCIC) on March 28, 2018. Results of the record search indicate that 167 previous cultural resources studies have been completed within the boundaries of the City. The records search also determined 138 previously recorded cultural resources are located within the City boundaries. Of these 138 resources, 87 are prehistoric archaeological sites, 36 are prehistoric isolated artifacts, five are multicomponent sites, one is a historic archaeological site, two are isolated historic isolates, six are historic resources, and one, Heritage Hill, is an archaeological district and is also recorded on the Nation Register of Historic Places and designated as a California Historical Landmark as well as Orange County Historical Landmark.

A Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on March 23, 2018. On March 23, 2018, the NAHC responded that a search of the SFL was completed with positive results. According to the NAHC, a site has been recorded in the Santiago Peak 7.5' United States Geographical Survey topographic quadrangle

that may be impacted by the project and to contact the Juaneño Band of Mission Indians for more information. The NAHC recommended that 11 Native American tribal organizations be contacted , in addition to the four tribal organization who had previously requested AB52 consultation with the City, as they may have additional knowledge of the religious and cultural significance of cultural resources within or immediately adjacent to the City of Lake Forest. The City of Lake Forest sent information and consultation to 15 tribal organizations to meet the requirements of Senate Bill 18 and Assembly Bill 52.

A general analysis of impacts of future projects within the City of Lake Forest that may adversely affect paleontological, archaeological, or historic resources is provided along with mitigation recommendations.

INTRODUCTION

PURPOSE OF STUDY

The objective of this study is to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Lake Forest (City) to support an update of the City's General Plan. The City of Lake Forest covers 10,240 acres and is located in southern Orange County (Figure 1).

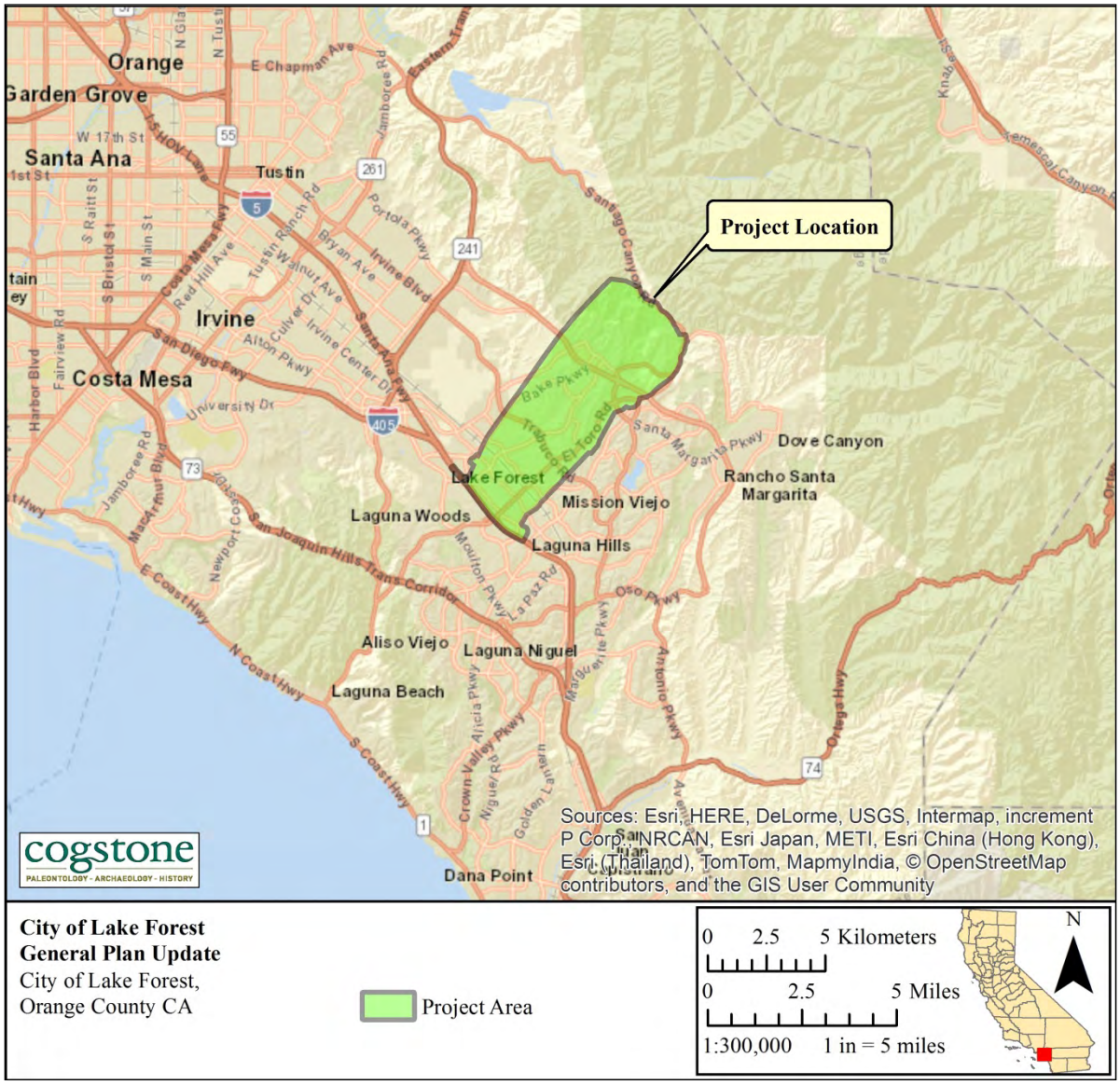

Figure 1. Project Vicinity Map

PROJECT LOCATION AND DESCRIPTION

Located in Orange County, the City of Lake Forest is located in the Saddleback Valley, southwest of Modjeska Canyon and the Santa Ana Mountains (Figures 2a and 2b). The City is bounded on the west by the Cities of Laguna Hills and Laguna Woods, on the south by the City of Mission Viejo, on the north by the Saddleback Mountains, and on the east by the City of Irvine. Oriented northwest-southeast within the Saddleback Valley, the City's northwestern portion is located within the Aliso Creek Watershed that originates from the Santa Ana Mountains while its southeastern portions occupy portions of the Tustin Plain. Specifically, the City of Lake Forest is located primarily within the El Toro United States Geographical Survey (USGS) 7.5' topographic map, and includes portions of the San Juan Capistrano and Santiago Peak USGS 7.5' topographic maps (Table 1).

Table 1. City of Lake Forest Cadastral Information

USGS 7.5 Topographic Quad(s)	Township	Range	Section(s)
El Toro	5S	7W	29, 30, 31, 32
		8W	25, 36
	6S	7W	05, 06, 07, 08, 18
		8W	01, 02, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24
El Toro and San Juan Capistrano	6W	8W	26, 27, 28
San Juan Capistrano	6W	8W	34, 35
Santiago Peak	6W	7W	04, 33

The proposed project (project) is an update to the City of Lake Forest General Plan and is intended to provide guidance for long-term growth, maintenance, preservation, and decision-making in the City over the next 20-plus years. Following its incorporation in 1991, the City of Lake Forest adopted its current General Plan in 1994; since that time, the City has revised some of its elements to respond to changing circumstances and state legislation (Land Use in 2016, Housing in 2014, Circulation in 2008, and Recreation and Resources in 2015). The General Plan Update is expected to consist of the following elements: Land Use and Community Design; Circulation, Economic Development; Recreation and Resources; Public Safety and Noise; and Public Facilities. Because the Housing Element Update is certified through 2021, it is not included in this General Plan Update.

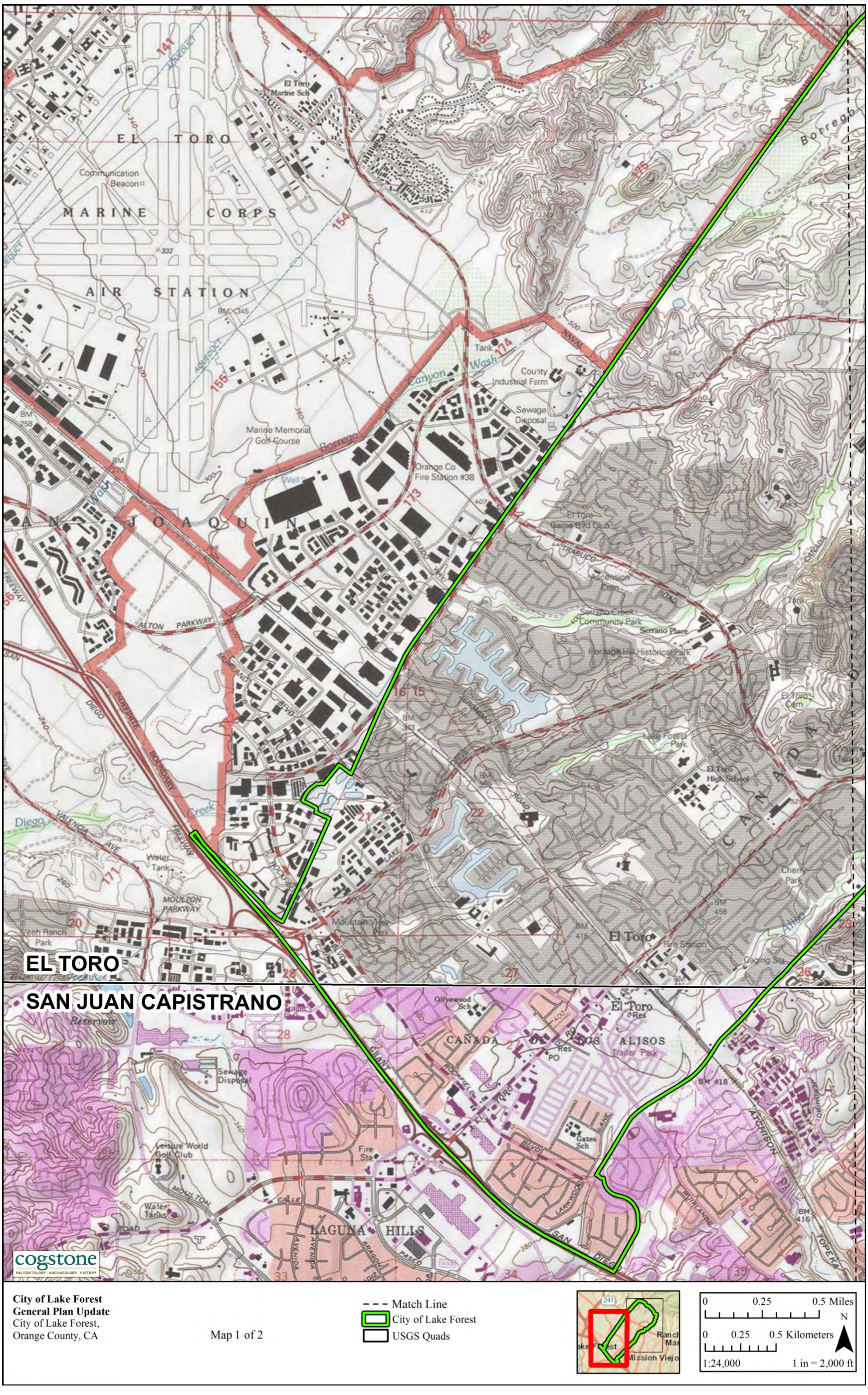

Figure 2a. Project Location, Map 1 of 2

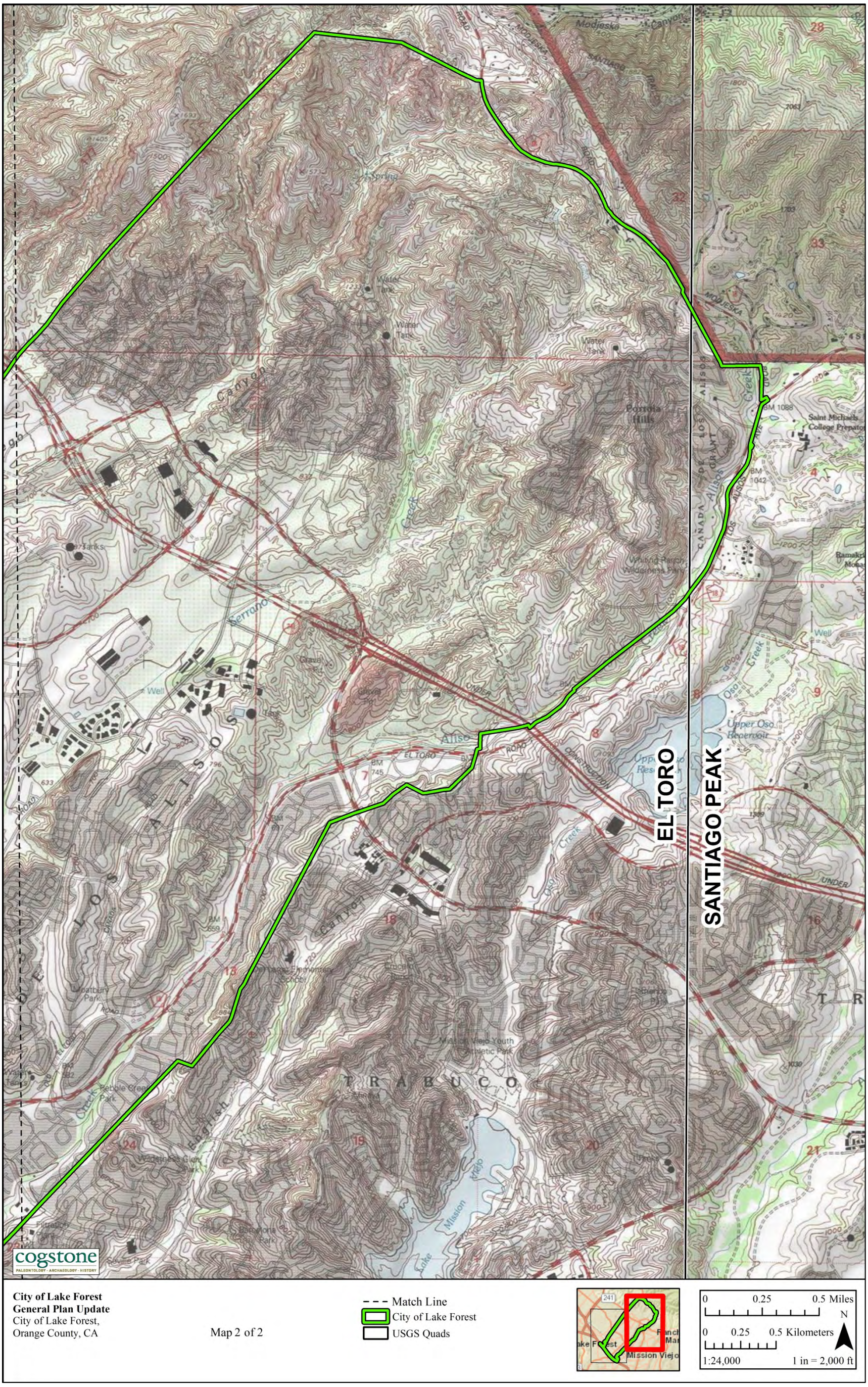

Figure 2b. Project Location, Map 2 of 2

PROJECT PERSONNEL

Cogstone Resource Management Inc. (Cogstone) conducted the cultural and paleontological resources studies. Qualifications of Cogstone personnel are provided (Appendix A).

- Desireé Martinez served as the Principal Archaeologist for this Project. Ms. Martinez has an M.A. in Anthropology from Harvard University, Cambridge, and more than 21 years of experience in southern California archaeology.

- Kim Scott served as the Principal Paleontologist for the Project and wrote the geological and paleontological portions of this report. Scott has a M.S. in Biology with paleontology emphasis from California State University, San Bernardino, a B.S. in Geology with paleontology emphasis from the University of California, Los Angeles, and over 23 years of experience in California paleontology and geology.

- Sherri Gust served as the Task Manager for this Project and wrote the prehistoric and ethnographic sections. Gust is a Registered Professional Archaeologist and has an M.S. in Anatomy (Evolutionary Morphology) from the University of Southern California, a B.S. in Anthropology from the University of California at Davis and over 36 years of experience in California.

- Megan Wilson prepared the maps, conducted the archaeological and historic records search, wrote the historic context, and drafted portions of the report. Wilson has a M.A. in Anthropology from California State University, Fullerton and has over seven years of experience in southern California archaeology.

REGULATORY ENVIRONMENT

CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970 (CEQA) (PRC § SECTION 21000 ET SEQ.)

CEQA states that: It is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed project and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. If archaeological or paleontological resources are identified as being within the proposed project study area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

TRIBAL CULTURAL RESOURCES

In 2015, CEQA was amended and established that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (Public Resources Code [PRC] § 21084.2). In order to be considered, a "tribal cultural resource" must be a site, feature, place, cultural landscape, sacred place, or object, which is of cultural value to a California Native American Tribe and is either:

(1) listed, or determined to be eligible for listing, on the national, state, or local register of historic resources, or
(2) a resource that the lead agency chooses, in its discretion, to treat as a tribal cultural resource.

To help determine whether a project may have such an effect, the lead agency must consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project. Consultation must take place prior to the determination of whether a negative declaration, mitigated negative declaration, or environmental impact report is required for a project (PRC § 21080.3.1).

In applying those criteria, a lead agency must consider the value of the resource to the tribe. For example, in considering the criterion that a resource is "associated with the lives of persons important in our past," a lead agency would ask whether the resource is associated with the lives of persons important to the relevant tribe's past. That determination must be supported with substantial evidence.

If a lead agency determines that a project may cause a substantial adverse change to tribal cultural resources, the lead agency must consider measures to mitigate that impact. PRC §20184.3 (b) (2) provides examples of mitigation measures that lead agencies may consider to avoid or minimize impacts to tribal cultural resources.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES (PRC § 5024.1)

The California Register of Historical Resources (CRHR) is a listing of all properties considered to be significant historical resources in the state. The California Register includes all properties listed or determined eligible for listing on the National Register, including properties evaluated under Section 106, and State Historical Landmarks number No. 770 and above. The California Register statute specifically provides that historical resources listed, determined eligible for listing on the California Register by the State Historical Resources Commission, or resources that meet the California Register criteria are resources which must be given consideration under CEQA (see above). Other resources, such as resources listed on local registers of historic registers or in local surveys, may be listed if they are determined by the State Historic Resources Commission to be significant in accordance with criteria and procedures to be adopted by the Commission and are nominated; their listing in the California Register, is not automatic.

Resources eligible for listing include buildings, sites, structures, objects, or historic districts that retain historical integrity and are historically significant at the local, state or national level under one or more of the following four criteria:

1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2) It is associated with the lives of persons important to local, California, or national history;
3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance.

Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

PUBLIC RESOURCES CODE SECTION § 5097.5

Section 5097.5: No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands (lands under state, county, city, district or public authority jurisdiction, or the jurisdiction of a public corporation), except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

NATIVE AMERICAN HUMAN REMAINS

Sites that may contain human remains important to Native Americans must be identified and treated in a sensitive manner, consistent with state law (i.e., Health and Safety Code §7050.5 and Public Resources Code §5097.98), as reviewed below:

> In the event that human remains are encountered during project development and in accordance with the Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that “No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value.”

ATTACHMENT A, CITY OF LAKE FOREST LOCAL GUIDELINES FOR IMPLEMENTING THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

In 2017, the City of Lake Forest adopted procedures to implement the California Environmental Quality Act ("CEQA"), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines ("State CEQA Guidelines"), 14 California Code of Regulations Section 15000 et seq. The procedures established herein implement and tailor the general provisions of the State CEQA Guidelines to the specific operations of the City of Lake Forest ("City"). These Local Guidelines are intended to supplement the State CEQA Guidelines" (City of Lake Forest 2017). Section 5-1 specifically identifies the evaluation of impacts to historic (Section 5-1, l) and archaeological (Section 5-1, m) resources:

L) EVALUATING IMPACTS ON HISTORIC RESOURCES

Projects that may cause a substantial adverse change in the significance of a historical resource, as defined in Local Guidelines Section 10.28, are projects that may have a significant effect on the environment, thus requiring consideration under CEQA. Particular attention and care should be given when considering such projects, especially projects involving the demolition of a historical resource, since such demolitions have been determined to cause asignificant effect on the environment.

Substantial adverse change in the significance of a historical resource means physical demolition, destruction, relocation or alteration of the resource or its immediate surroundings, such that the significance of a historical resource would be materially impaired The significance of a historical resource is materially impaired when a project:

> (1) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the California Register of Historical Resources;
>
> (2) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources or its identification in a historical resources survey, unless the Lead Agency establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
>
> (3) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by the Lead Agency for purposes of CEQA.

Generally, a project that follows either one of the following sets of standards and guidelines will

be considered mitigated to a level of less than significant: (a) the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings; or (b) the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer.

In the event of an accidental discovery of a possible historical resource during construction of the project, the City may provide for the evaluation of the find by a qualified archaeologist or other professional. If the find is determined to be a historical resource, the City should take appropriate steps to implement appropriate avoidance or mitigation measures. Work on non-affected portions of the project, as determined by the City, may continue during the process. Curation may be an appropriate mitigation measure for an artifact that must be removed during project excavation or testing.

M) EVALUATING IMPACTS ON ARCHAEOLOGICAL SITES

When a project will impact an archaeological site, the City shall first determine whether the site is a historical resource, as defined in Local Guidelines Section 10.28. If the archaeological site is a historical resource, it shall be treated and evaluated as such, and not as an archaeological resource. If the archaeological site does not meet the definition of a historical resource, but does meet the definition of a unique archaeological resource set forth in Public Resources Code Section 21083.2, the site shall be treated in accordance with said provisions of the Public Resources Code. The time and cost limitations described in Section 21083.2(c-f) do not apply to surveys and site evaluation activities intended to determine whether the project site contains unique archaeological resources.

If the archaeological resource is neither a unique archaeological resource nor a historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

In the event of an accidental discovery of a possible unique archaeological resource during construction of the project, the City may provide for the evaluation of the find by a qualified archaeologist. If the find is determined to be a unique archaeological resource, the City should take appropriate steps to implement appropriate avoidance or mitigation measures. Work on non-affected portions of the project, as determined by the City, may continue during the process. Curation may be an appropriate mitigation measure for an artifact that must be removed during project excavation or testing.

When an Initial Study identifies the existence of, or the probable likelihood of, Native American human remains within the Project, the City shall comply with the provisions of State

CEQA Guidelines Section 15064.5(d). In the event of an accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the City shall comply with the provisions of State CEQA Guidelines Section 15064.5(e)

BACKGROUND

GEOLOGICAL SETTING

The project area is in the northern extent of the California Geomorphic Province known as the Peninsular Ranges. The Peninsular Ranges geomorphic province extends from Mount San Jacinto in the north, through the tip of Baja, Mexico in the south. Subparallel to these ranges on the east is the San Andreas Fault Zone. The northwestwards motion of the Pacific Plate has created these ranges and their corresponding valleys (Wagner 2002).

PALEONTOLOGICAL SETTING

The City has a complicated paleoenvironmental history which began at the age of dinosaurs about 66 million years old (66 Ma; Table 2). The past 66 Ma has seen the City transition from coastal lowlands during the Paleocene to Oligocene, to shallow marine during the early Miocene, to deep marine during the early to early-late Miocene, back to shallow marine in the latest Miocene through the Pliocene, and finally to increasingly arid terrestrial deposits from the Pleistocene to the Holocene. Detail on each geological unit is in the Stratigraphy Section below.

STRATIGRAPHY

Geologic mapping by Morton and Miller (2006) maps the area as 28 separate units ranging from modern deposits to Paleocene sediments (Table 2; Figures 3a and 3b). Geological units are discussed in order from oldest to youngest.

Table 2. Geologic units within the City

Epoch	Age Range	Unit Name	Paleoenvironment
modern	<200 years	artificial fill (Qaf)	man-made
late Holocene	<5,000 years (<5 ka)	very young colluvial deposits (Qc)	slope deposit
		very young landslide deposits (Qls, Qls?)	landslide
		very young slope wash deposits (Qsw)	slope wash
late Pleistocene to Holocene	<120 ka	young axial-channel deposits (Qya)	flood-plains
		young alluvial-fan deposits (Qyf)	alluvial fan
		young landslide deposits (Qyls)	landslide
early to middle Pleistocene	~11.7 ka - ~2.6 million years (Ma)	very old axial-channel deposits (Qvoa, $Qvoa_2$, $Qvoa_3$)	flood-plains
		very old alluvial-fan deposits (Qvof)	alluvial fan
Pliocene	~2.6 Ma - ~5.3 Ma	Niguel Formation (Tn)	shallow marine
late Miocene to early Pliocene	~3.6 Ma - ~11.6 Ma	Capistrano Formation (Tc, Tco, Tcs)	shallow-marine
late Miocene	~5.3 Ma - ~11.6 Ma	Puente Formation (Tp, Tplv, Tpsq)	deep marine, submarine fan
		Monterey Formation (Tm)	deep marine
middle Miocene	~11.6 Ma - ~16 Ma	Topanga Group (Tt)	shallow to deeper marine
latest Oligocene to latest early Miocene	~16 Ma - ~23 Ma	Vaqueros Formation (Tv)	shallow marine
		Vaqueros-Sespe Formation (Tvs)	shallow marine - nonmarine
late Eocene to early Miocene	~16 Ma - ~41.2 Ma	Sespe Formation (Ts)	nonmarine
Paleocene	~56 Ma - ~66 Ma	Santiago Formation (Tsa)	coastal lowland
		Silverado Formation (Tsi, Tsicg, Tsis)	coastal nonmarine to very shallow-marine

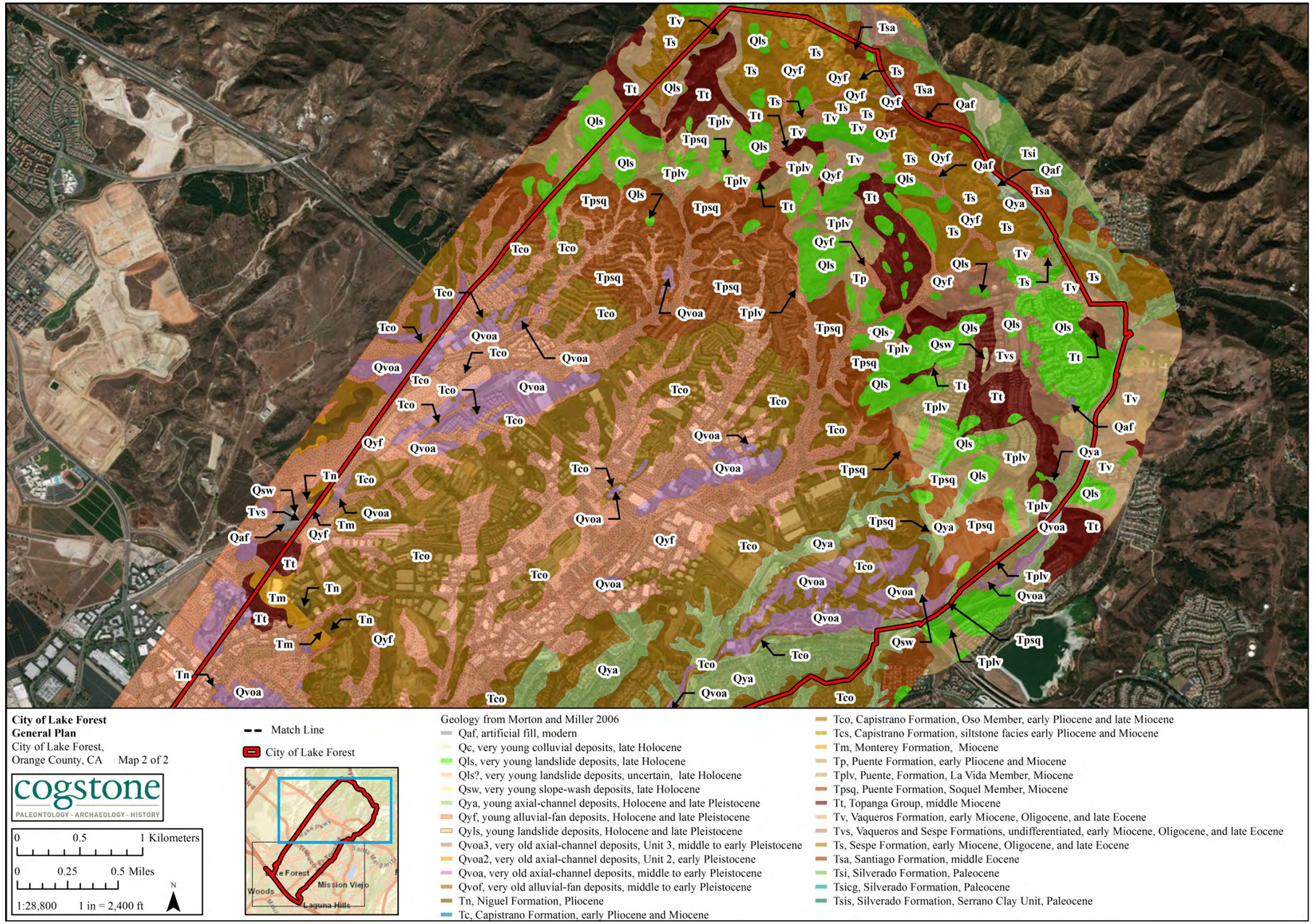

Figure 3a. Geology Map, 1 of 2

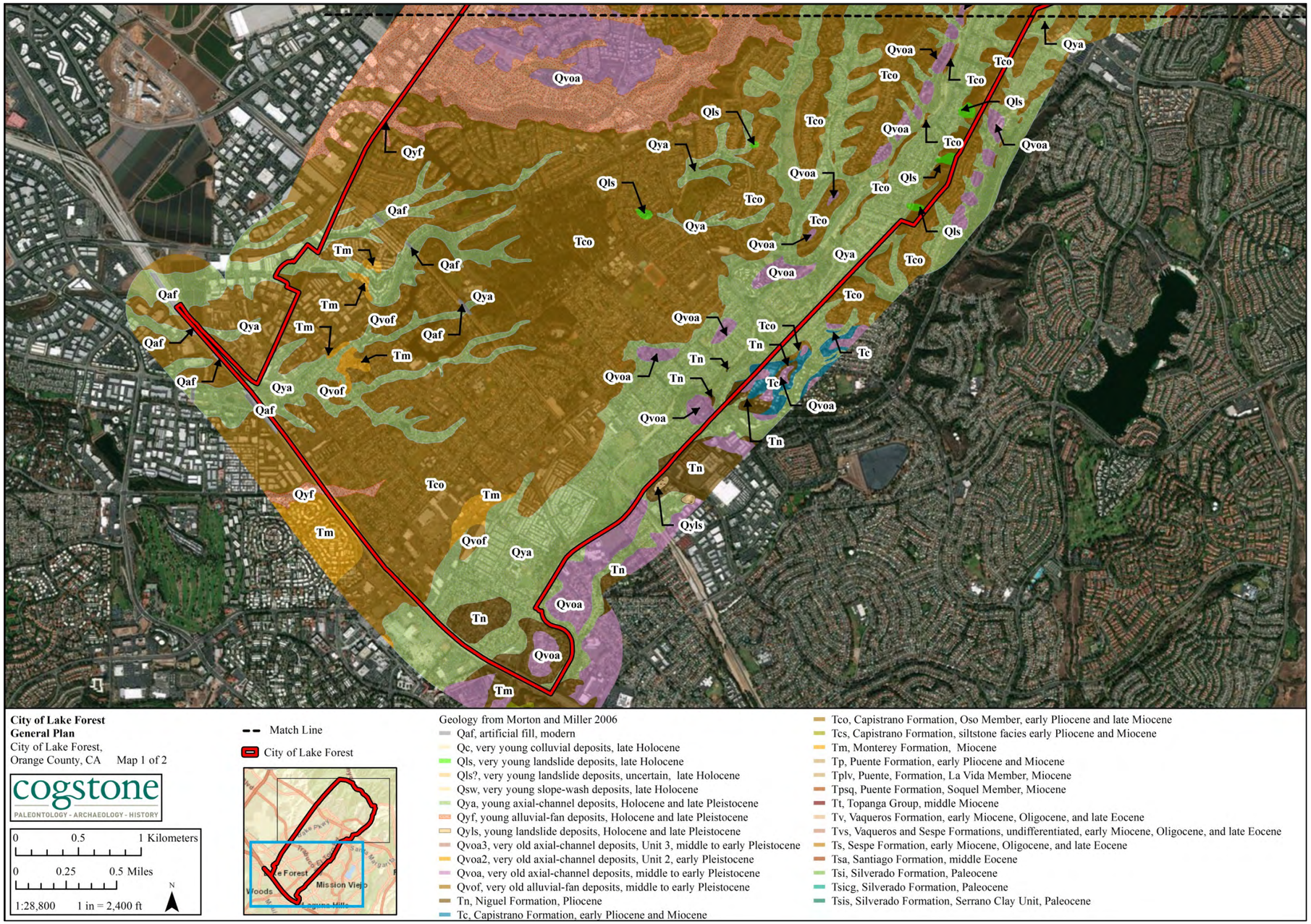

Figure 3b. Geology Map, 2 of 2

PALEOCENE ROCKS (~66 MILLION YEARS OLD [MA] TO ~56 MA)

Silverado Formation (Tsicg, Tsi, Tsis)
Thickness of these coastal nonmarine swamp and slough to very shallow-marine delta and bay, sandstone and siltstone deposits range from 200 m to 450 m in the Santa Ana Mountains. This formation is divided into a basal conglomerate (Tsicg) overlain by sandstone and siltstone of the undifferentiated Silverado Formation (Tsi) that locally includes the Serrano Clay bed (Tsis). The basal conglomerate is typically between 2 m and 12 m thick but can reach a thickness of 40 m. It is typically massive, pale gray to reddish-brown, nonfossiliferous, pebble to cobble conglomerate. In some areas, clast sizes increase to a boulder conglomerate (Schoellhamer et al. 1981, Morton and Miller 2006).

Above the basal conglomerate, the Silverado Formation consists of marine and nonmarine, sandstone and siltstone. Clasts are largely of quartz and clay with some conglomerate. In the Robinson Ranch area, a prolific flora of fossil land plants has been recovered. The Serrano Clay is present within the upper Silverado Formation. It is a 1 m thick marker bed composed of pale gray to white, soft and plastic clay and quartz with carbonaceous shale and lignite beds. Marine mollusks can be abundant and include the distinctive and diagnostic Paleocene marine snail, *Turritella pachecoensis* in some eastern exposures (Schoellhamer et al. 1981, Eisentraut and Cooper 2002, Morton and Miller 2006).

MIDDLE EOCENE DEPOSITS (~47.8 MA TO ~37.8 MA)

Santiago Formation (Tsa)
Sediments consist of marine and nonmarine deposits from a coastal lowland paleoenvironment. At the base is a conglomerate with the clasts that originated from western central Mexico where the Santiago Formation was originally deposited. The north-westerly movement of the Pacific Plate by the San Andreas Fault Zone brought these sediments into southern California. Pale gray sandstone and some interbedded siltstone occurs above the conglomerate. Marine invertebrates and petrified wood are present in this unit (Schoellhamer et al. 1981, Morton and Miller 2006).

LATE EOCENE TO LATEST EARLY MIOCENE DEPOSITS (~41.2 MA TO ~17.4 MA)

Sespe Formation (Ts)
This red to grey, non-marine mudstone to conglomerate occurs as massive to thick bedded deposits with poorly developed bedforms (Eisentraut and Cooper 2002, Morton and Miller 2006). This terrestrial deposit includes fluvial, floodplain, and alluvial fan deposits. This formation also reflects a major drop in global sea levels (Eisentraut and Cooper 2002, McCulloch and Bayer 2004). Fossils of the late Uintan (middle Eocene - 44.5 Ma to 39.5 Ma) North American Land Mammal Age (NALMA) to latest Hemingfordian (middle Miocene ~17.5 Ma) NALMA are present within the Sespe Formation (Lander 1983, Lucas et al. 1997, Whistler and Lander 2003).

MIOCENE EPOCH (~23 MA TO ~5.3 MA)

The Miocene Epoch was a dramatic time in southern California. The San Andreas Fault began bringing Pacific Plate lands from the south, volcanoes erupted, mountain grew, and numerous coastal marine basins were formed. Orange County rests in one of these basins - the Los Angeles Basin. During the Miocene, the Los Angeles Basin was tectonically active. Opening of the basin began about 17.4 Ma (McCulloch and Bayer 2004) and was followed by subsidence and creation of a deep marine depositional basin (Figure 4). Sediments are estimated to be up to six miles thick, one of the thickest Neogene stratigraphic successions in the world (Eisentraut and Cooper 2002).

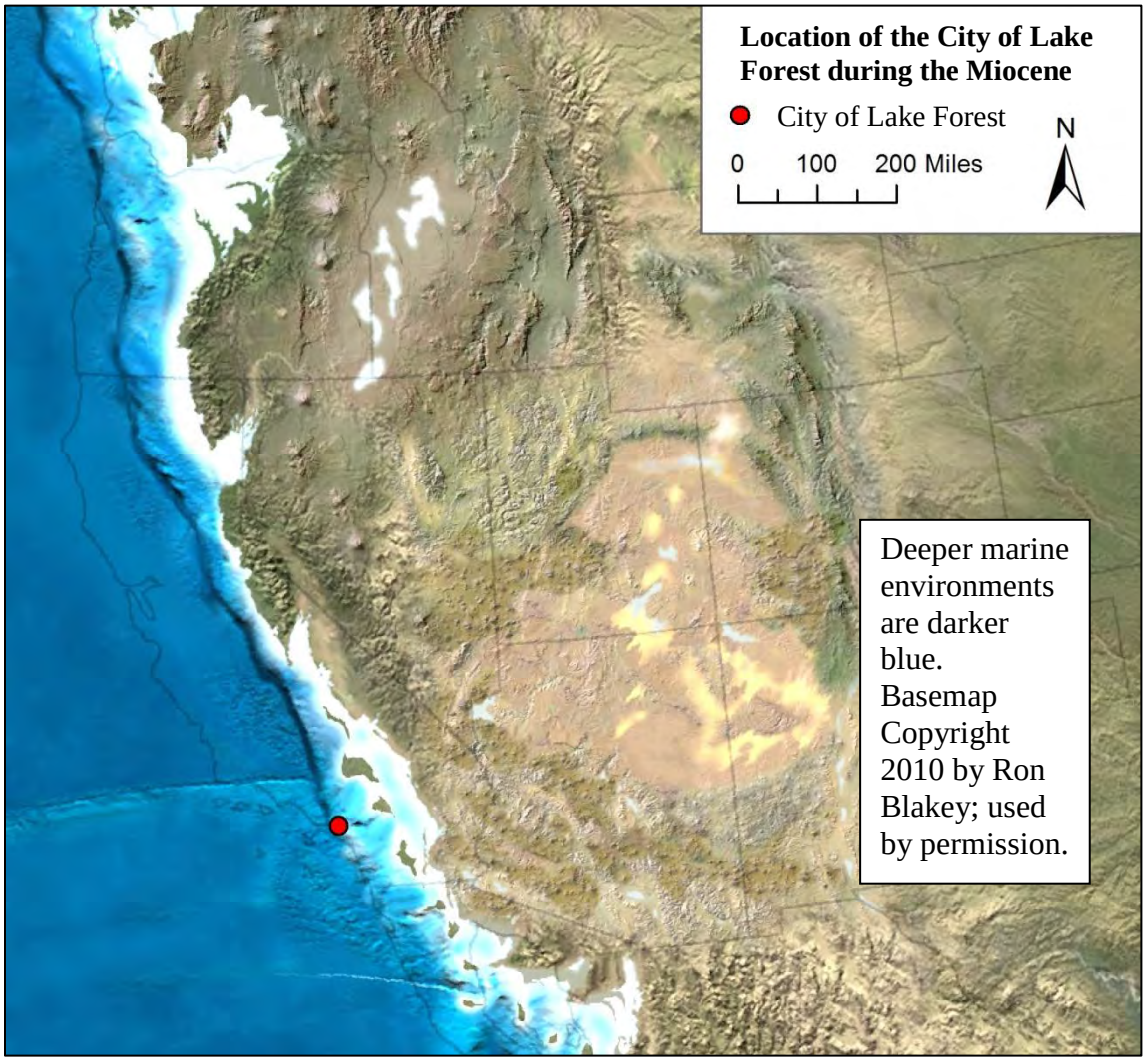

Figure 4. City in late to middle Miocene at the edge of a deep marine environment

LATEST OLIGOCENE TO LATEST EARLY MIOCENE (~19.5 MA TO ~17.4 MA)

Vaqueros-Sespe Formation (Tvs)

These two formations interfinger so much in many areas of California that they are mapped together. Sespe Formation sediments are generally coarser than those of the Vaqueros Formation. The Vaqueros-Sespe section and can reach thicknesses between 1,500 and 2,000 feet in the Lake Forest area (McCulloch and Bayer 2004). See the individual descriptions for each for more information.

Vaqueros Formation (Tv)

The shallow marine Vaqueros Formation occurs as greenish-gray to very dark gray, massive- to thick-bedded silty sandstone. Sandstone beds interfinger with thin-bedded siltstone and shale, mudstone, and minor conglomerate (Morton and Miller 2006, McCulloch and Bayer 2004). Deposition of the Vaqueros Formation began about 24 Ma and ended in most of the Los Angeles area between 17.5 Ma and 17.4 Ma based on the dating of volcanics, marine mollusks, benthic foraminifea, magnetic polarity stratigraphy, and other methods (Nagle and Parker 1971, Yerkes and Campbell 1979, Schoellhamer et al. 1981, Blake 1983, Mason and Swisher 1989, Nourse et al. 1998, Prothero et al. 1996, Lucas et al. 1997, Liddicoat 2001, McCulloch et al. 2001, Prothero and Donohoo 2001, McCulloch et al. 2002, Ludtke and Prothero 2003, Lander et al. 2003, Whistler and Lander 2003, McCulloch and Bayer 2004). The appearance of marine sediments after the non-marine Sespe Formation indicates rising global sea levels.

MIDDLE MIOCENE DEPOSITS (~17.4 MA TO ~11.6 MA)

Topanga Group (Tt)

Undifferentiated Topanga Group sediments consist primarily of coarse-grained, massive to thick-bedded sandstone and conglomerate. A tan to grey, well indurated, basal sandy conglomerate bed ranging from 2 m to 9 m is present (Schoellhamer et al. 1981). Clasts in the conglomerate are predominantly granitic and gneissic with some volcanics. Above the basal conglomerate, are interfingering, thinly bedded, fine to coarse-grained sandstone, siltstone, and minor amounts of diatomaceous and partially silicified shale. While the shale is grey to greyish-white, coarser sediments are yellow to yellowish-tan (Morton and Miller 2006). Deposition began about 17.4 Ma and ended about 15.9 Ma based on dating of underlying and overlying volcanics (Turner and Campbell 1979, McCulloch et al. 2002, McCulloch and Bayer 2004).

The shallow to deep marine Topanga Group was one of the first units to be deposited in the rapidly deepening Los Angeles Basin. Much of these deep submarine fan and plain deposits occurred between 13 Ma and 5 Ma and corresponds with deposition of the Topanga and Monterey formations (Redin 1991, McCulloch and Bayer 2004). The Los Angeles Basin – Tustin Plain continues to be filled by modern deposition today.

LATE MIOCENE DEPOSITS (~11.6 MA TO ~5.3 MA)

Monterey Formation (Tm)

This siliceous and diatomaceous marine mudstone, shale, diatomite, and some chert is primarily white to pale brown and thinly laminated or bedded. In the San Juan Capistrano area, lower part of Puente Formation grades laterally southward into Monterey Formation (Morton and Miller 2006). Sediments are part of a deep submarine fan and plain deposits that was deposited between 13 Ma and 5 Ma (Redin 1991). Locally named "Pecten Reef", a limestone in the Aliso Viejo area has produced abundant invertebrate and vertebrate fossils. The Monterey Formation was deposited at the same time as the Soquel Member, La Vida Member, and the lower portion of the undifferentiated Puente Formation (Morton and Miller 2006).

Puente Formation (Tp, Tpsq, Tplv)

The deep marine Puente Formation has produced numerous fossil localities of marine animals and algae as well as terrestrial plants and animals that were washed in. Fossils are found primarily in the finer grained deposits, but can occur in all sediments. These sediments were deposited at the same time as the Monterey Formation. Within the City are three units: the undifferentiated Puente Formation, the younger Soquel Member, and the basal La Vida Member (Morton and Miller 2006).

The undifferentiated Puente Formation consists of sandstone, siltstone, and shale. The Soquel Member is primarily a marine sandstone with minor amounts of shale. Beds are yellowish grey to grey, massive to well-bedded, silts to very coarse grained sandstone, interbedded with matrix supported pebble conglomerate (Morton and Miller 2006). The member ranges from 200 to 310 feet thick in the eastern Puente Hills and the sediments have been interpreted to be middle to inner submarine fan facies (Cooper 1981).

The basal La Vida Member sediments are primarily light-gray to black, massive to well bedded, generally friable siltstone with some sandstone beds from a 2 cm to over 1 meter thick. Fish remains are common and include deep water species (Morton and Miller 2006).

LATE MIOCENE TO EARLY PLIOCENE DEPOSITS (~11.6 MA TO ~3.6 MA)

Capistrano Formation, undifferentiated (Tc)

The undifferentiated Capistrano Formation consists of marine siltstone and sandstone which is widespread in the San Joaquin Hills (Morton and Miller 2006).

Capistrano Formation, Siltstone Facies (Tcs)

The informal siltstone facies of the Capistrano Formation appear as white to pale gray, massive to crudely bedded, friable, siltstone and mudstone. Locally this unit contains sandstone,

calcareous mudstone beds, and sparse diatomaceous and tuffaceous beds (Morton and Miller 2006).

Capistrano Formation, Oso Sand (Tco)
The Oso Sand of the Capistrano Formation consists of white to light gray, massive, medium- to coarse-grained, friable, marine sandstone with scattered matrix-supported pebbles, cobbles, and concretions (Morton and Miller 2006). The bay that occupied the region was named the Capistrano Embayment (Reed and Hollister 1936). This embayment was a broad flat-bottomed structural trough that extended at least 22 miles inland from the present-day shoreline. How far offshore it extended is undetermined because of its merging with the deep offshore basins. Water depths in the Capistrano Embayment reached nearly 2,000 meters at it deepest point (Ingle 1979). Marine fossils are typically well preserved and provide an excellent look into this time period in California.

PLIOCENE DEPOSITS (~5.3 MA TO ~2.6 MA)

Niguel Formation (Tn)
These very near-shore marine, brownish-gray, poorly sorted, coarse-grained sandstone is interbedded with conglomeratic sandstone and conglomerates. Marine mollusks recovered previously indicates water of a sublittoral-depth (Vedder 1960, Morton and Miller 2006).

EARLY TO MIDDLE PLEISTOCENE DEPOSITS (2.6 MA TO 120,000 YEARS OLD [120 KA])
Axial channel deposits were emplaced adjacent to streams in through-going stream valleys. Undifferentiated very old axial channel sediments are dominated by sand, but contain scattered gravel and pebble layers, as well as silt and clay-bearing alluvium. These deposits are moderately to well-indurated, reddish-brown, and are highly pigmented in upper parts. Upper surfaces are mostly very dissected (Morton and Miller 2006).

Two subunits are present within the project area, the early to middle Pleistocene unit 3 ($Qvoa_3$) and the early Pleistocene unit 2 ($Qvoa_2$). Both descriptions are essentially the same as that of the undifferentiated very old axial channel (Morton and Miller 2006).

Very old alluvial fan deposits (Qvof)
Alluvial fan deposits are deposited into our valleys from local mountains via the mouths of canyons. Sediments are moderately to well indurated, silts to bouldery conglomerates, with slightly to moderately dissected fan surfaces. In much of Peninsular Ranges these sediments are moderately well indurated, orangish brown sand and silt with well dissected fan surfaces (Morton and Miller 2006). Clasts coarsen upstream with boulders up to several meters across being deposited near the mountains during flash floods

LATE PLEISTOCENE TO HOLOCENE DEPOSITS (LESS THAN 120 KA)

Young axial channel deposits (Qya)
Axial channel deposits were emplaced adjacent to streams in through-going stream valleys. Sediments are slightly to moderately indurated and consist of silts to pebbles (Morton and Miller 2006).

Young alluvial fan deposits (Qyf)
Alluvial fan deposits are deposited into our valleys from local mountains via the mouths of canyons. Sediments are unindurated to moderately indurated, silts to bouldery conglomerates, with slightly to moderately dissected fan surfaces (Morton and Miller 2006). Clasts coarsen upstream with boulders up to several meters across being deposited near the mountains during flash floods.

Young landslide deposits (Qyls)
Landslides are the result of slope failures and typically result in chaotically emplaced sediments. Slides may or may not be active and have slightly dissected or modified surfaces (Morton and Miller 2006). In less chaotic slides and slumps beds can sometimes be traced and given stratigraphic context.

LATE HOLOCENE DEPOSITS (LESS THAN 5 KA)

Very young colluvial deposits (Qc)
Colluvium is present as unconsolidated scree, soils, or other materials and are primarily found at the base of hills. These sediments have been emplaced by rain wash or slow continuous downslope creep (Morton and Miller 2006).

Very young landslide deposits (Qls, Qls?)
Landslides are the result of slope failures and typically result in chaotically emplaced sediments. Slides may or may not be active and have well preserved morphology (Morton and Miller 2006). In less chaotic slides and slumps beds can sometimes be traced and given stratigraphic context.

Very young slope wash deposits (Qsw)
Very similar to the colluvial deposits, slope wash is also associated with hillsides. The unconsolidated, typically angular, sand to boulder sized clasts have been emplaced by water not confined to channels (Morton and Miller 2006).

MODERN DEPOSITS (LESS THAN 200 YEARS OLD)

Artificial fill (Qaf)

Modern fill is frequently not mapped on geologic maps due to its ubiquitous nature. Although fill is typically less than a few feet thick, it can be substantially thicker in the areas of overpasses, freeways, and other large earthworks. Any fossils that may be encountered therein are not scientifically significant.

ETHNOGRAPHY

The City is mostly located within the traditional territory of the Tongva (Gabrielino) but along the boundary of the territory of the Acjachemen (Juaneño) (McCawley 1996; Figure 5). Ethnographically, Aliso Creek was recorded as the boundary between the Gabrielino to the northeast and the Juaneño to the southwest (Kroeber 1976). The names Juaneño and Gabrielino were names imposed on Native Americans by Spanish missionaries to identify the indigenous peoples who occupied the surrounding areas of Mission San Juan Capistrano and Mission San Gabriel Arcángel, respectively.

TONGVA

The Tongva speak a language that is part of the Takic language family. At the time of Spanish contact, their territory encompassed a vast area stretching from Topanga Canyon in the northwest, to the base of Mount Wilson in the north, to San Bernardino in the east, Aliso Creek in the southeast and the four Southern Channel Islands, in all an area of more than 2,500 square miles (Bean and Smith 1978, McCawley 1996).

The Tongva are considered to have been one of the wealthiest tribes and to have greatly influenced tribes they traded with (Kroeber 1976:621). Houses were domed and circular structures thatched with tule or similar materials (Bean and Smith 1978:542). The best known artifacts were made of steatite and were highly prized. Many common everyday items were decorated with inlaid shell or carvings reflecting an elaborately developed artisanship (Bean and Smith 1978:542).

The main food zones utilized were marine, woodland, and grassland (Bean and Smith 1978). Plant foods were, by far, the greatest part of the traditional diet at contact. Acorns were the most important single food source. Villages were located near water sources necessary for the leaching of acorns, which was a daily occurrence. Grass seeds were the next most abundant plant food used along with chia. Seeds were parched, ground, and cooked as mush in various combinations according to taste and availability. Greens and fruits were eaten raw or cooked or sometimes dried for storage. Bulbs, roots, and tubers were dug in the spring and summer and usually eaten fresh. Mushrooms and tree fungus were prized as delicacies. Various teas were

made from flowers, fruits, stems and roots for medicinal cures as well as beverages (Bean and Smith 1978:538-540).

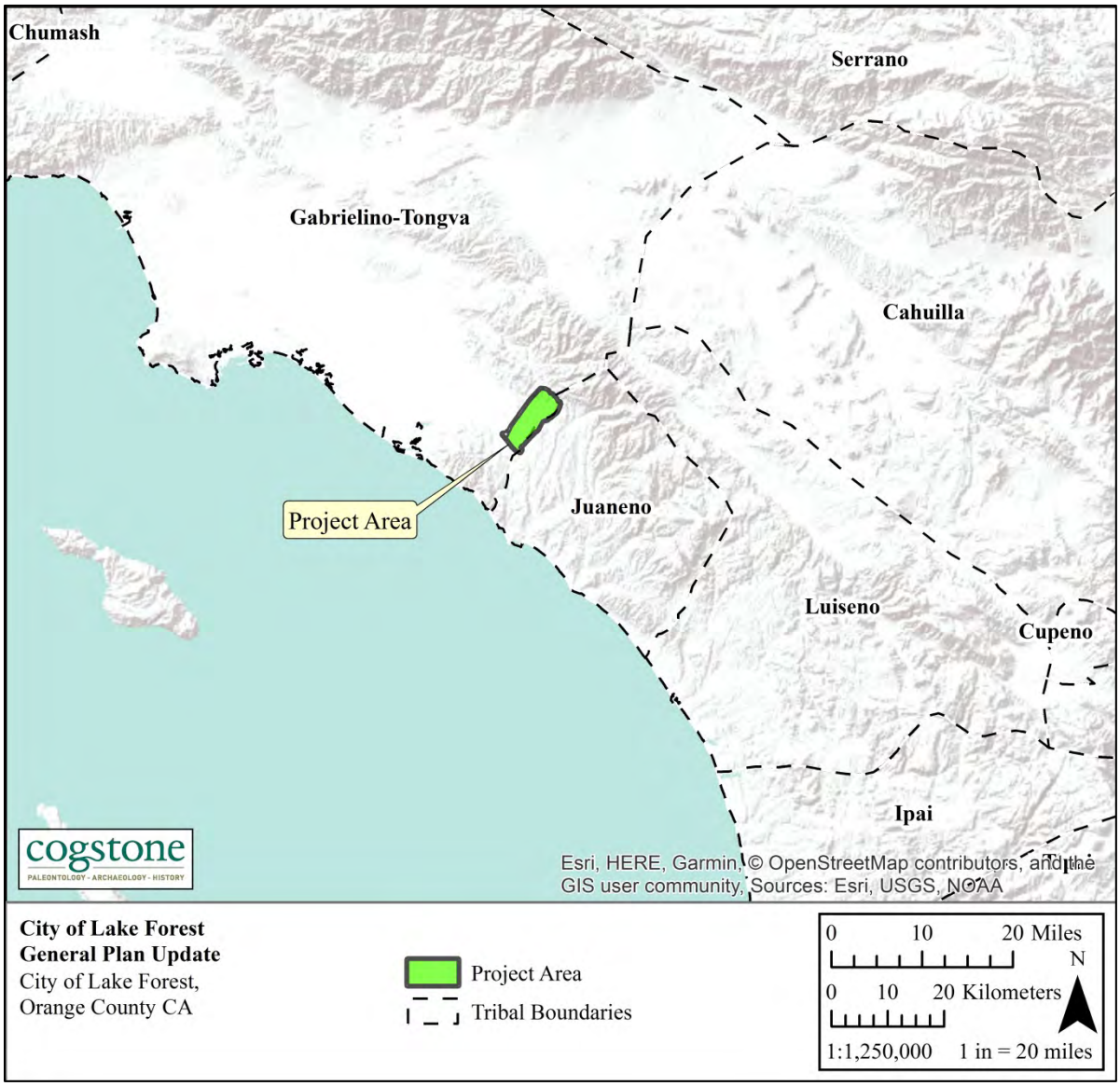

Figure 5. Ethnographic Tribal Boundaries.

The principal game animals were deer, rabbit, jackrabbit, woodrat, mice, ground squirrels, antelope, quail, dove, ducks and other birds. Most predators were avoided as food, as were tree squirrels and most reptiles. Trout and other fish were caught in the streams, while salmon were available when they ran in the larger creeks. Marine foods were extensively utilized. Sea mammals, fish and crustaceans were hunted and gathered from both the shoreline and the open ocean, using reed and dugout canoes. Shellfish were the most common resource, including abalone, turbans, mussels, clams, scallops, bubble shells, and others (Bean and Smith 1978:538-540).

Acjachemen

The Acjachemen (Juaneño) speak a language that is part of the Takic language family also. Their traditional tribal territory was situated partly in northern San Diego County and partly in southern Orange County (Figure 5). The boundaries were Las Pulgas Creek (south), Aliso Creek (north), the Pacific Ocean (west) and the Santa Ana Mountains (east). Villages were mostly along San Juan Creek, Aliso Creek, Trabuco Creek and San Mateo Creek (O'Neil and Evans 1980).

In prehistory, the Acjachemen had a patrilineal society and lived in groups with other relatives. These groups had established claims to places including the sites of their villages and resource areas. Marriages were usually arranged from outside villages establishing a social network of related peoples in the region. There was a well-developed political system including a hereditary chief. Religion was an important aspect of their society. Religious ceremonies included rites of passage at puberty and mourning rituals (Kroeber 1925:636-647).

Houses were typically conical in shape and thatched with locally available plant materials. Work areas were often shaded by rectangular brush-covered roofs (ramada). Each village had a ceremonial structure in the center enclosed by a circular fence where all religious activities were performed (Bean and Shipek 1978:553).

Women are known to have been the primary gathers of plants foods, but also gathered shellfish and trapped small game animals. Men hunted large game, most small game, fished, and assisted with plant food gathering, especially of acorns. Adults were actively involved in making tools including nets, arrows, bows, traps, food preparation items, pottery and ornaments. Tribal elders had important political and religious responsibilities and were involved in education of younger members (Bean and Shipek 1978:555).

PREHISTORIC SETTING

Approaches to prehistoric frameworks have changed over the years from being based on material attributes to radiocarbon chronologies to association with cultural traditions. Recently the fact that generalized terminology is suppressing the identification of cultural, spatial and temporal

variation and the movement of peoples throughout space and time was noted. These factors are critical to understanding adaptation and change (Sutton and Gardner 2010:1-2; Table 3).

The older Encinitas Cultural Tradition characteristics are abundant metates and manos, crudely made core and flake tools, bone tools, shell ornaments, very few projectile points with subsistence focusing on collecting (plants, shellfish, etc.). Faunal remains vary by location but include shellfish, land animals, marine mammals and fish (Sutton and Gardner 2010:7). The Encinitas Tradition pattern in coastal Los Angeles and Orange Counties has is represented by the Topanga Phase (Sutton and Gardner 2010: 8-25; Table 3).

In Topanga Phase I typical characteristics were a few mortars and pestles, abundant core tools (scraper planes, choppers and hammerstones), relatively few large, leaf-shaped projectile points, cogged stones, and early discoidals (Table 3). Secondary inhumation under cairns was the common mortuary practice. In Orange County as many as 600 flexed burials were present at one site and dated 6, 435 radiocarbon years before present (Sutton and Gardner 2010:9, 13).

In Topanga Phase II, flexed burials and secondary burial under cairns continued. Adoption of the mortar and pestle is a marker of this phase. Other typical artifacts include manos, mutates, scrapers, core tools, discoidals, charmstones, cogged stones and an increase in the number of projectile points. In Orange County stabilization of sea level during this time period resulted in increased use of estuary, near shore and local terrestrial food sources (Sutton and Gardner 2010:14-16).

In Topanga Phase III, there was continuing abundance of mutates, manos, and core tools plus increasing amounts of mortars and pestles. More numerous and varied types of projectile points are observed along with the introduction of stone-line earthen ovens. Cooking features such as these were possibly used to bake yucca or agave. Both flexed and extended burials are known (Sutton and Gardner 2010:17).

The younger Cultural Traditions consist of two roughly contemporaneous patterns called Angeles in Los Angeles and northern Orange Counties and Palomar in southern Orange and San Diego Counties. They are marked by a series of changes in the archaeological record, including bow and arrow, new rock art styles, settlement and subsistence systems, and perhaps ideology. The Angeles Phase appears to have been less technologically conservative and more ecologically diverse, with a largely terrestrial focus and greater emphases on hunting and nearshore fishing.

Table 3. Culture Change Chronology

Pattern	Phase	Dates (BP)	Material Traits	Other Traits
Encinitas	Topanga I	8,500 to 5,000	Abundant manos and metates, many core tools and scraper s, few but large points, charmstones, cogged stones, early discoidals, faunal remains rare	Shellfish and hunting important, secondary burials under metate cairns (some with long bones only), some extended inhumations, no cremations
	Topanga II	5,000 to 3,500	Abundant but decreasing manos and metates, adoption of mortars and pestles, smaller points, cogged stones, late discoidals, fewer scraper planes and core tools, some stone balls and charmstones	Shellfish important, addition of acorns, reburial of long bones only, addition of flexed inhumations (some beneath metate cairns), cremations rare
	Topanga III	3,500 to 1,500	Abundant but decreasing manos and metates, increasing use of mortars and pestles, wider variety of small projectile points, stone-lined ovens	Hunting and gathering important, flexed inhumations (some under rock cairns), cremations rare, possible subsistence focus on yucca/agave
Angeles/ Palomar	Angeles III & IV/ San Luis Rey I	1,500 to 500	Appearance of bow and arrow technology, bone awls and stone/shell ornaments; changes in *Olivella* beads; asphaltum becomes important; reduction in obsidian use; Obsidian Butte obsidian largely replaces Coso	Small game hunting and the gathering of seeds and nuts, especially acorns important. Some small major villages, some focus on coastal resources; larger seasonal villages; flexed primary inhumations but no extended inhumations and an increase in cremations; appearance of obsidian grave goods
	Angeles V & VI/ San Luis Rey II	500 to 150	Ceramic pipes definitely present, addition of Tizon Brown pottery and ceramic figurines, Addition of Euroamerican material culture (e.g., glass beads and metal tools), locally made pottery, metal needle-drilled *Olivella* beads	Primary pit cremation as the principal mortuary practice, no formal cemeteries, summer villages near water with winter villages in mountains, use of domesticated species from Euroamericans; apparent adoption of Chingichngish religion

Angeles and San Luis Rey Phases demonstrate formation of major village sites along with small satellite villages. Angeles III & IV and San Luis Rey I Phases reflect a number of changes including a decrease in the use of scrapers, occasional mortars with associated manos and pestles, the appearance of bow and arrow technology, bone awls, and stone/shell ornaments. Conspicuous black midden appears also. Primary inhumation was common with primary pit cremation used more through time (Sutton 2010).

Angeles V & VI and San Luis Rey II Phases reflect important changes including appearance of Tizon Brown pottery and ceramic figurines, steatite shaft straighteners, and introduction of Euroamerican materials such as glass beads and metal knives. Other characteristics include an increase in bedrock milling features with mortars and slicks, and the appearance of cupule boulders and rock rings. Primary cremation in pits appears to have been the principal mortuary practice. Locations of cremations were not marked and there were no formal cemeteries (Sutton 2010).

HISTORIC SETTING

SPANISH EXPLORATION

Juan Cabrillo was the first European to sail along the coast of California in 1542 and was followed in 1602 by Sebastian Vizcaino (Bean and Rawls 1993). The Spanish colonization of what was then known as Alta California began with the 1769 overland expedition led by Gaspar de Portolá with a crew of 63 men in order to explore the land between San Diego and Monterey (Fox 1939). Between 1769 and 1822 the Spanish had colonized California and established missions, presidios, and pueblos and documented the people and landscape along the way (McCawley 1996).

Portola and his expedition crossed the area north of Lake Forest in July 1769, naming the perennial creek that empties from the Santa Ana Mountains "*aliso*", the Spanish work alder; an error on the Spanish identifier, since they were in fact, referring to the sycamore tree, which still grow along the creek. It should be noted that the Juaneño term for the creek was *Seeevenga*, meaning "at the sycamores" (O'Neil 1988). However, historically, alder and sycamore trees were much more prominent, particularly in the riparian and floodplain areas where an oak-woodland habitat existed. During the Mission period, many of the trees along the creek, including alder, oak, sycamore, and other species were cut down for the construction of ships and structures, charcoal production, and other uses (Nasser 2003).

Following the Portolá Expedition, vast tracts of land were granted to the Missions. The seventh of the Franciscan missions in California was Mission San Juan Capistrano, founded in 1776; shortly after Portolá's visit to the area. The goals of the missions were tri-fold: they helped establish a Spanish presence on the west coast, allowed for a means to Christianize the native peoples, and served to exploit the native population as laborers. The Spanish also hoped each mission would become a town center, whereas, "the pueblo would receive a ground of four square leagues of land… and other property would be parceled out among the Indians". The missionaries, or padres, would essentially serve as a mayor, or head of the town (Bean 1968:29-30).

MEXICAN PERIOD

In 1821 Mexico won its independence from Spain and worked to lessen the wealth and power held by the missions. The Secularization Act was passed in 1833, appropriating the vast mission lands to the Mexican governor and downgrading the missions' status to that of parish churches. The governor then redistributed the former mission lands, in the form of land grants, to private owners (Bean and Rawls 1993; Robinson 1948). The lands were typically granted to soldiers who proved their loyalty to the Mexican government once liberated from the Spanish crown.

One these Mexican soldiers was José António Fernando Serrano who was the youngest son of Francisco Serrano, former Acalade (mayor) of the Pueblo of Los Angeles (Fox 1939). José António Fernando Serrano was granted the 10,688 acre Rancho Canada De Los Alisos, or "glen of the alders" by Governor Juan Bautista Alvarado in 1842. The grant was enlarged in 1846 by a second grant by Pio Pico in 1846 (Robinson 1948). The two combined grants that made the rancho closely mirror the shape of present day City of Lake Forest (Figure 6). The boundaries of the land grant were El Camino Real to the west, Aliso Creek and Rancho Trabuco to the south, Santiago Road and the Santa Ana Foothills to the east, and Rancho San Juaquin and Lomas Santiago to the north.

Rancho Canada de Los Alisos, like the other ranchos in what would become Orange County was centered on cattle husbandry and was a self-sustaining operation at its conception (Irons 1976). Cattle dominated and transformed the landscape. As the hide and tallow industry grew, and rancheros began trading their raw goods for manufactured good that came by the way of ship in the Bay (Bahía) of San Juan Capistrano, what is now present day Dana Point. Steer hides and tallow were traded for manufactured goods (hides-harnesses, shoes, saddles, door hinges, tallow-candles, horns-buttons) often made from, in many cases, from the same hide the rancheros were trading. The trade in cow hides was so ubiquitous that a steer hide, dried and folded in half (worth between one-and-a-half to two-and-a-half dollars) was referred to a "California bank note", or a "leather dollar", or "one buck", hence the popular American slang term (Dana 1840). The area was long known as "El Toro" after the steers who roamed Canada de Los Alisos, whose loud, bellowing sounds could be heard from great distances (Irons 1976).

José Serrano used the local Native American population as well as the mestizo (Spanish and Native) population to build, plant, plow, and tend to the livestock of the rancho, resembling the feudal system (Osterman 1992). In addition to cattle, Serrano bred Mustangs and sheep, he also grew grain, corn, watermelons, and grapes. José Serrano acted as the *Juez de Campo*, or judge of the fields, an official role that was tasked with settling disputes between rancheros over livestock ownership as well as presiding over (Irons 1976).

AMERICAN PERIOD

Following the cession of California to the United States after the Mexican-American War, a claim for the Rancho was filed with the Public Land Commission in 1852 as required by the Land Act of 1851, and the grant was eventually patented to Serrano in 1871 after much litigation (Carpenter 2003).

After the cession of California to the United States, a stagecoach route passed through the El Toro as early as the late 1850s and a stagecoach stop was established just south of El Toro (Fox

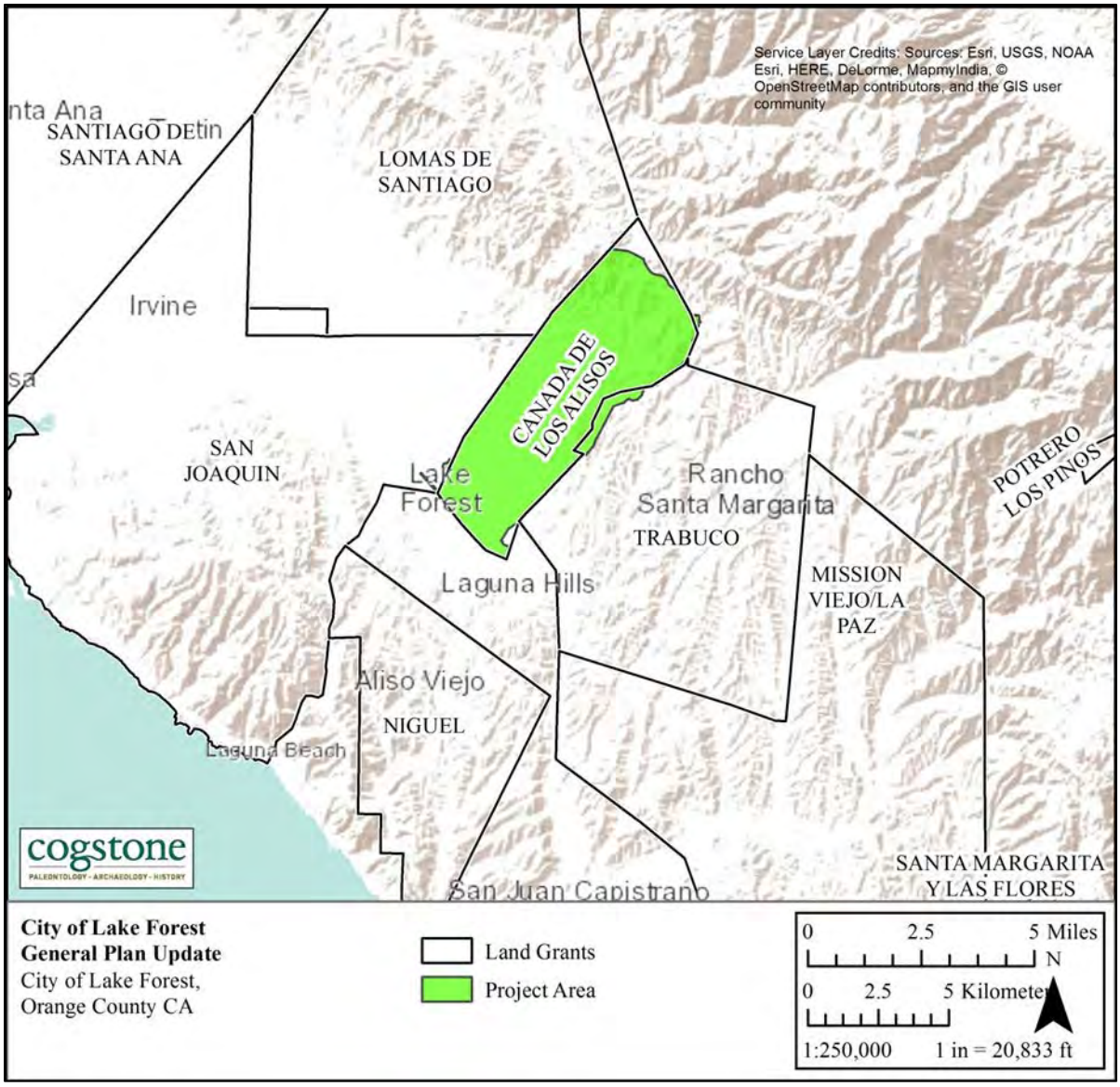

Figure 6. Mexican Land Grants.

1979). Stagecoaches primarily carried mail, but carried passengers as well. The El Toro stop became a popular holdover for passengers traveling to the coast via Laguna Canyon.

A series of droughts affected the area from 1863 until 1883 causing the death of Serrano's herds as well as the herds of the surrounding ranchos (Fox 1939). Serrano borrowed money at outrageous interest rates, using his land as collateral. Serrano eventually went bankrupt and was forced to mortgage and ultimately foreclose the ranch to J.S. Slauson, a Los Angeles banker. Losing control of the Rancho Canada de Los Alisos, Serrano and his family were evicted from their land (Irons 1976). Serrano purchased U.S. government claims just north of their former

rancho near Cooks Corner at the intersection of El Toro, Santiago Canyon, and Live Oak Canyon where some of his descendants still live (Osterman 1992).

Slauson subdivided the land into ten parcels and leased a portion of the rancho lands to Juan Gless and his sons who raised sheep during the drought. When the drought subsided, more families settled into the Saddleback Valley. Settlers raised cattle and sheep, planted vineyards and fruit trees. By 1886 the majority of the Saddleback Valley was planted in grapes, until plant disease called the "Anaheim Disease" decimated the vineyards. Orange and walnuts trees soon replaced the failed vineyards (Irons 1976).

By the time Bostonian Dwight Whiting purchased 10,000 acres of the former Rancho de Los Alisos in 1884, the area was already a stagecoach stop that connected San Diego and Los Angeles, with later diversions to Santa Ana and Laguna Beach (Figure 7). Whiting intended to establish a new town inhabited by English gentlemen farmers. Whiting was able bring the San Bernardino and San Diego Railway Co. through his land in 1887, thus founding the town of Aliso City (Irons 1976). The railroad "boom" brought an influx of people into southern California and numerous cities were proposed. On paper, many of these cities were absorbed by larger ones, while most, like Aliso City, remained small towns (Osterman 1992).

The young Aliso City was laid out just north of the railroad tracks, and some of those original streets remain on the map today. Front, Second, and Third Streets run parallel to the railroad tracks, while Orange, Olive, and Cherry Street run parallel to El Toro Road. At the time, El Toro Road was originally Los Alisos Avenue and present day Los Alisos Boulevard was formally Lemon Avenue (Osterman 1992). The "boom" never attached the hordes of people to Aliso City that its founders had hoped for and the name Aliso City was too similar to a nearby place, so the local residents of the area held a meeting in a freight room of the railroad depot and voted to permanently rename their small town to El Toro (Osterman 1992).

Determined to attract "gentlemen farmers" of English heritage, Whiting used his vast land holding to experiment on a number of agricultural ventures to attract the second and third born English sons who could not inherit land, but could use their family's wealth to sponsor careers in farming (Osterman 1992). Whiting experimented with multiple crops including fruit trees like apricots, peaches, plums, prunes, and olives; all with little success. Another unsuccessful, but lasting contribution to the area was Whiting's investment in the Eucalyptus craze that struck the lumber starved southern California. Whiting established a 400 acre of dense Eucalyptus tree forest located between present day Ridge Route, Jeronimo, Lake Forest and Serrano Roads. However, when it was discovered that the grain twisted and cracked as it dried, rendering it worthless for construction and furnishings the hopeful cash crop busted. While the failed project was later referred to as "Whiting's Folly", the Eucalyptus is now a ubiquitous characteristic of

the present day Lake Forest, the city's name originating from Whiting's man-made forest (Irons 1976).

In the 1890s, the Saddleback Valley was dry framed by tenant farming, in which farmers did not own their land, but rented it from their landlords, also known as sharecropping (Osterman 1992). Dry farming crops included barley (the major grain crop), and hay for the livestock. Black-eyed beans were also dry farmed and, while more difficult to farm, turned a higher profit (Osterman 1992). It wasn't until the 1920s that citrus came to the Saddleback Valley. Charles Bennet, an early pioneer attracted to the former Aliso City, pioneered the citrus industry in El Toro by drilling deeper wells (Osterman 1992). Despite the success in citrus in El Toro, the City remained small, serving as the Saddleback Valley's shipping and social center (Osterman 1992).

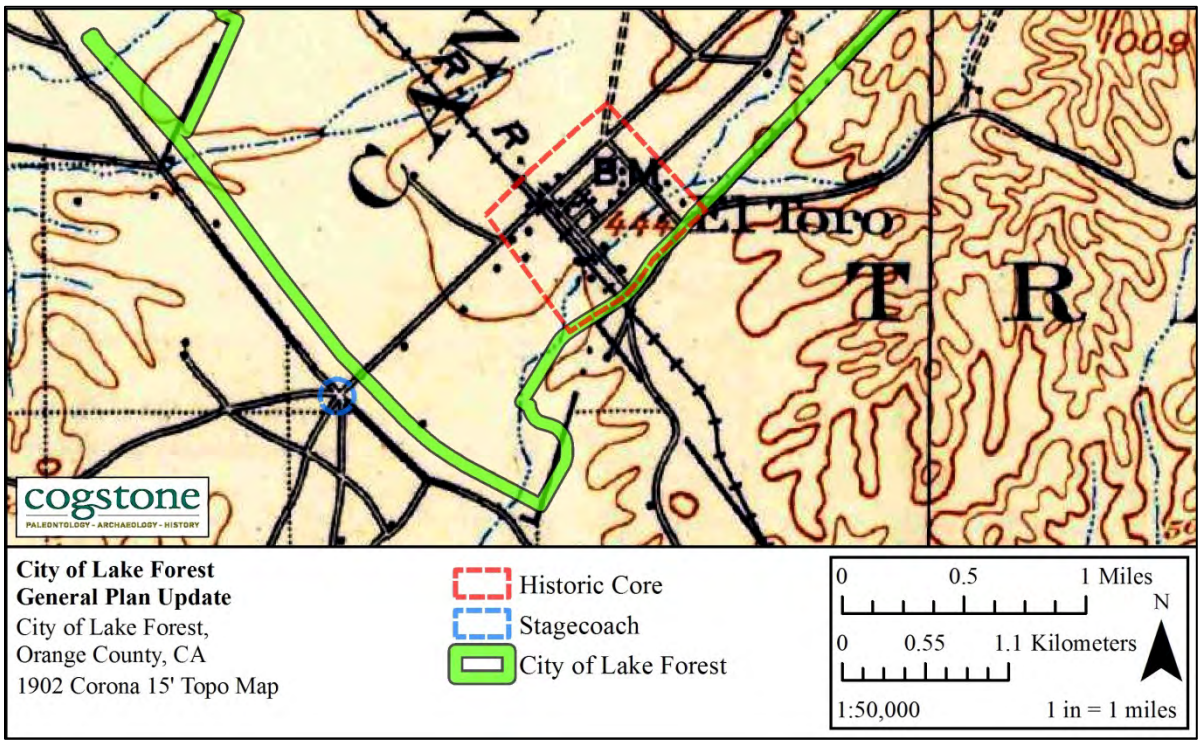

Figure 7. 1902 Corona 15' USGS topographic map showing historic core and stagecoach stop.

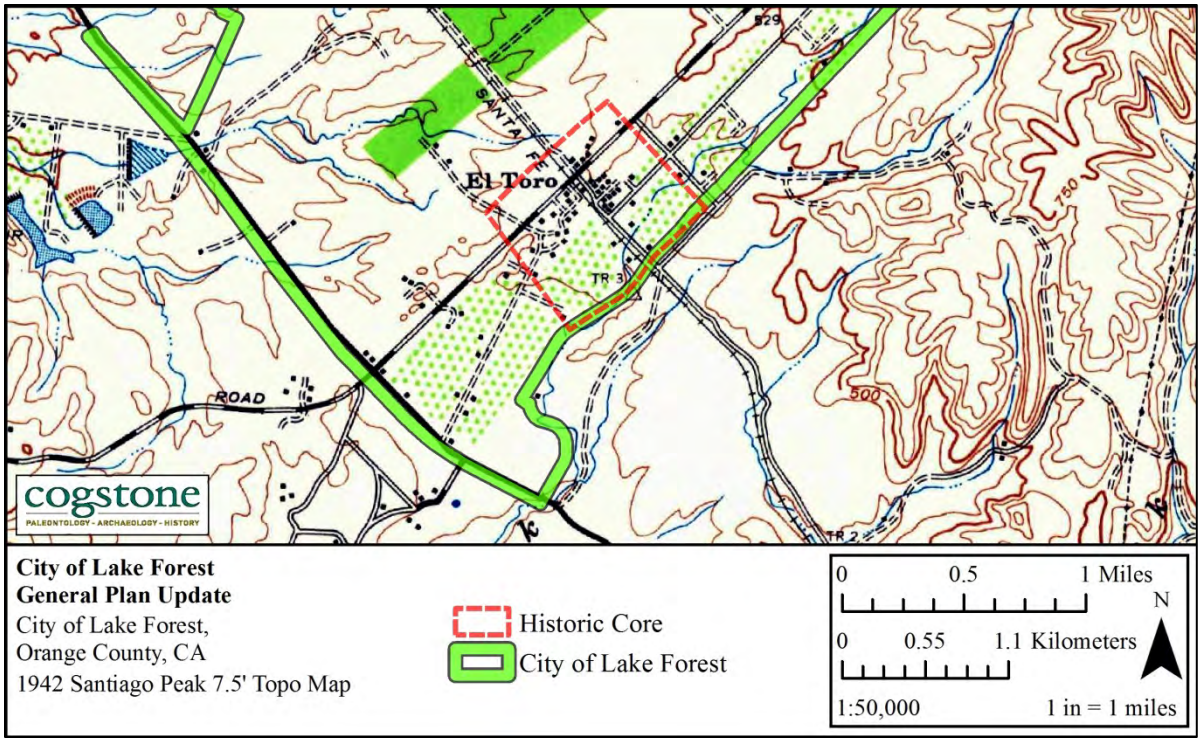

Figure 8. 1942 Santiago Peak 7.5' USGS topographic map showing Historic Core.

MODERN PERIOD

In 1942, El Toro Marine Corps Air Station was established and was designated as a Master Jet Station and after World War II all United States Presidents landed in Air Force One at this base. After World War II the agricultural land was developed into residential, commercial, and industrial areas. In 1999 the Marine Corps Air Station El Toro was decommissioned.

In 1958, Whiting sold the Rancho to V.P. Baker and associates. In 1969, the Bakers sold the property to the Deane Bros. who later incorporated into the Occidental Petroleum, Land Development Division. They started the residential development of the area, executing a master planned community that eventually became the City of Lake Forest. During the 1960s, a steady supply of water brought in by aqueducts from Northern California, as well as from the Colorado River, facilitated the transformation of the Saddleback Valley from and agricultural community to the multi-city, suburban sprawl it is known as today (Osterman 1992). The City of Lake Forest was incorporated in 1991 and is named for the two man-made lakes within the city as well as the man-made Eucalyptus forest.

LITERATURE REVIEW AND RECORD SEARCHES

PALEONTOLOGICAL RECORD AND LITERATURE SEARCHES

A search for paleontological records was completed by the Natural History Museum of Los Angeles County (LACM; McLeod 2018; Appendix B). Published literature, unpublished paleontological reports, and online databases were also searched for fossil records (Appendix C). Databases included the Natural History Museum of Los Angeles County Invertebrate Paleontology (LACMIP 2018), the Paleobiology Database (PBDB 2018), and the University of California Museum of Paleontology (UCMP 2018).

The artificial fill and Holocene sediments do not contain fossil resources due to their age, by nature of their formation, or paleoenvironment. Although the Paleocene Silverado Formation and Santiago Formation, as well as the Pleistocene alluvial deposits have produced fossils within Orange County, there are no records of fossils from these formations from within the City. The rest of the formations have produced fossils from within the City. Formations are discussed from oldest to youngest (Appendix C).

PALEOCENE: SILVERADO FORMATION

At least 25 fossils of marine snails and bivalves have been recovered from the northwestern Santa Ana Mountains in Orange County (Schoellhamer et al. 1981). Sixteen localities were recovered from the Black Star Canyon 7.5’ USGS topographic quadrangle and a single locality was recovered from the Orange 7.5’ USGS topographic quadrangle. The Eastern Transportation Corridor (ETC) database listed one potential Silverado Formation locality from the El Toro 7.5’ USGS topographic quadrangle which produced plant fossils (Appendix C).

PALEOCENE: SANTIAGO FORMATION

At least 100 fossils of marine snails and bivalves have been recovered from this formation in the northwestern Santa Ana Mountains in Orange County. Eleven localities was recovered from the Black Star Canyon 7.5’ USGS topographic quadrangle, four localities were recovered from the El Toro 7.5’ USGS topographic quadrangle, three localities were recovered from the Orange 7.5’ USGS topographic quadrangle, and a single locality was recovered from the Tustin 7.5’ USGS topographic quadrangle (Schoellhamer et al. 1981). The Orange County Paleontological Database (OCPC 2018) listed one locality from the Black Star Canyon 7.5’ USGS topographic quadrangle which produced a crocodile and plant fossils (Appendix C).

LATE EOCENE TO LATEST EARLY MIOCENE: SESPE FORMATION

At least 25 fossils of terrestrial animals have been recovered from 17 localities in the Sespe Formation in Orange County. Two localities was recovered from the Lower Bowerman Landfill, nine localities were recovered from the Upper Bowerman Landfill, four localities were recovered from the Foothill Transportation Corridor-Oso segment, a locality was recovered from the San Joaquin Hills, and a locality was recovered from the San Joaquin Hills (Whistler and Lander 2003). The OCPC listed one locality from the El Toro 7.5' USGS topographic quadrangle (Appendix C). These localities have produced fossils of canine, weasel, peccary, oreodont, camel, musk deer, opossum, shrew, pika, squirrel, rodent, and iguana (Appendix C).

EARLY MIOCENE: VAQUEROS-SESPE FORMATION

At least 2400 fossils of terrestrial animals and plants have been recovered from 122 localities in the Vaqueros-Sespe Formation in Orange County (OCPC 2018, Whistler and Lander 2003, McLeod 2018). These localities have produced fossils of canine, bear, weasel, rhinoceros, horse, peccary, pig-like artiodactyl, oreodont, camel, deer-like artiodactyl, musk deer, hedgehog, shrew, pika, rabbit, squirrel, rodent, opossum, and reptile (Appendix C).

EARLY MIOCENE: VAQUEROS FORMATION

At least 150 fossils of marine animals have been recovered from 24 localities in the Vaqueros Formation in Orange County (LACMIP 2018, SDNHM 2018, UCMP 2018). These localities have produced fossils of baleen and toothed whales, sea cows, birds, sea turtles, bony fish, sharks and rays, and invertebrates (Appendix C).

MIDDLE MIOCENE: TOPANGA GROUP

At least 375 fossils of marine and terrestrial animals have been recovered from 37 localities in the Topanga Group in Orange County (McLeod 2018, UCMP 2018, OCPC 2018). These localities have produced fossils of pinnipeds, baleen and toothed whales, dugongs, sea cows, desmostylians, proboscideans, rodents, birds, sea turtles, bony fish, sharks, rays, and invertebrates (Appendix C).

LATE MIOCENE: MONTEREY FORMATION

At least 150 fossils of marine animals have been recovered from 31 localities within and near to the City of Lake Forest (McLeod 2018, OCPC 2018, SDNHM 2018, UCMP 2018). These localities have produced fossils of pinnipeds, baleen and toothed whales, dugongs, desmostylians, birds, crocodile, sea turtles, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities (Appendix C).

LATE MIOCENE: PUENTE FORMATION

At least 275 fossils of marine animals have been recovered from 32 localities from the La Vida Member (OCPC 2018). These localities have produced fossils of sea lions, desmostylians, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities. A fossil of a herring have been recovered a locality in the Soquel Member (OCPC 2018). Two fossils of bony fish have been recovered two localities in undifferentiated Puente Formation (OCPC 2018, Appendix C).

LATE MIOCENE TO EARLY PLIOCENE: CAPISTRANO FORMATION

At least 375 fossils of marine and terrestrial animals have been recovered from 33 localities from the Oso Sand of the Capistrano Formation (OCPC 2018, SDNHM 2018). These localities have produced fossils of pinnipeds, rodents, camels, baleen and toothed whales, horses, rhinoceros, mastodon, dugong, sea cows, desmostylians, birds, sea turtles, tortoise, bony fish, sharks and rays, and invertebrates. Numerous species of land plants and algae have also been recovered from these localities (Appendix C).

At least 100 fossils of marine and terrestrial animals have been recovered from 30 localities from undifferentiated deposits of Capistrano Formation (McLeod 2018, UCMP 2018). These localities have produced fossils of pinnipeds, camels, baleen and toothed whales, horses, birds, sea turtles, tortoise, crocodile, bony fish, sharks and rays, and invertebrates (Appendix C).

PLIOCENE: NIGUEL FORMATION

An unknown number of fossils of marine and terrestrial animals have been recovered from four localities from undifferentiated deposits of Niguel Formation (McLeod 2018). These localities have produced fossils of camels, baleen whales, dugongs, and bony fish (Appendix C).

PLIOCENE TO PLEISTOCENE: NIGUEL FORMATION- QUATERNARY TERRACE

A fossil of a sea lion and a camel have been recovered two localities in Niguel Formation – Quaternary terrace deposits (McLeod 2018; Appendix C).

PLEISTOCENE DEPOSITS

At least 225 fossils of terrestrial animals have been recovered from 29 localities from Pleistocene deposits outside of the City of Lake Forest (McLeod 2018, OCPC 2018, Jefferson 1991b). These localities have produced fossils of ground sloth, short faced bear, American lion, mammoth, mastodon, horses, ancient bison, shrews, reptiles, and amphibians (Appendix C). The most significant of these localities is Costeau Pit located in the City of Laguna Hills, just south of Lake Forest which has additionally produced coyote, dire wolf, saber-toothed cat, camel, llama, diminutive pronghorn, long-horned bison, rabbits, rodents, and birds.

The following units include Pleistocene sediments:

- Quaternary very old axial channel deposits (Qvoa, $Qvoa_2$, $Qvoa_3$); early to middle

Pleistocene

- Quaternary very old alluvial fan deposit (Qvof); early to middle Pleistocene
- Quaternary young axial channel deposit (Qya); late Pleistocene to Holocene
- Quaternary young alluvial fan deposit (Qyf); late Pleistocene to Holocene
- Quaternary young landslide deposit (Qyls); late Pleistocene to Holocene

HOLOCENE DEPOSITS

No fossils are known from any of the Holocene deposits as they are all too young to contain fossils. The following units are Holocene in age:

- Very young colluvial deposits (Qc); late Holocene
- Very young slope wash deposits (Qsw); late Holocene
- Very young landslide deposits (Qls); late Holocene
- Artificial fill; modern

CALIFORNIA HISTORIC RESOURCES INVENTORY SYSTEM

A search of the California Historic Resources Inventory System (CHRIS) at the South Central Coastal Information Center (SCCIC) located on the campus of California State University, Fullerton (CSUF) was conducted on March 28, 2018 by Cogstone archaeologist Megan Wilson. The records search covered the entire 10, 748.5 0 acres of the City of Lake Forest and covered portions of the El Toro, San Juan Capistrano, and Santiago Peak USGS 7.5 topographic maps. Results of the record search indicate that 167 previous cultural resources studies have been completed within the boundaries of the City of Lake Forest (Appendix D).

The records search determined that 138 previously recorded cultural resources are located within the City boundaries (Table 4). Of these 138 resources, one resource includes a portion of the Upper Aliso Creek Archaeological District, 87 prehistoric archaeological sites, 36 prehistoric archaeological isolates, five multicomponent sites, one historic archaeological site, two historic isolates, six historic resources, one historic district listed (Heritage Hill Historical Park) on the NRHP and CHL.

P- 30-156547. This site consists of a historic district, the Heritage Hill Historical Park located at 25151 Serrano Road, Lake Forest CA 92630-2534. This site is registered on the National Register of Historic Places (NR No. 7600050), California Historical Landmark (No. 199), and is registered as an Orange County Historical Landmark. The Site consists of the original location of the Serrano Adobe (1868) as well as the relocated Bennet Ranch House (1908), the El Toro Grammar School (1890), and the St. George's Episcopal Mission (1891).

Table 4. Previously Recorded Cultural Resources within the City of Lake Forest

Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-000016	CA-ORA-000016	Prehistoric Archaeological Site	Lithic scatter	1949	San Juan Capistrano
P-30-000037	CA-ORA-000037	Prehistoric Archaeological Site	Unidentified	1949	El Toro
P-30-000038	CA-ORA-000038	Multicomponent Site	Multicomponent	1949	El Toro
P-30-000039	CA-ORA-000039	Prehistoric Archaeological Site	Lithic scatter	1949, 1976, 1978	El Toro
P-30-000040	CA-ORA-000040	Prehistoric Archaeological Site	Lithic scatter	1949	El Toro
P-30-000042	CA-ORA-000042	Prehistoric Archaeological Site	Lithic scatter	1949, 1980	El Toro
P-30-000176	CA-ORA-000176	Prehistoric Archaeological Site	Lithic scatter	1966, 1991	El Toro
P-30-000438	CA-ORA-000438	Prehistoric Archaeological Site	Lithic scatter	1973, 1995, 1997, 2001	El Toro
P-30-000439	CA-ORA-000439	Prehistoric Archaeological Site	Lithic scatter	1973, 2001	El Toro, Santiago Peak
P-30-000440	CA-ORA-000440	Prehistoric Archaeological Site	Lithic scatter	1973, 2001	El Toro
P-30-000441	CA-ORA-000441	Prehistoric Archaeological Site	Lithic scatter, cairn	1973, 2001, 2007, 2014	El Toro
P-30-000442	CA-ORA-000442	Prehistoric Archaeological Site	Lithic scatter	1973, 2007	El Toro
P-30-000443	CA-ORA-000443	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000444	CA-ORA-000444	Prehistoric Archaeological Site	Lithic scatter	1974, 1994, 20017	El Toro
P-30-000445	CA-ORA-000445	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000446	CA-ORA-000446	Prehistoric Archaeological Site	Lithic scatter	1973, 2001, 2007	El Toro
P-30-000447	CA-ORA-000447	Prehistoric Archaeological Site	Lithic scatter	1973, 1978, 2007	El Toro
P-30-000448	CA-ORA-000448/H	Multicomponent Site	Lithic scatter, foundations	1974, 2001	El Toro
P-30-000449	CA-ORA-000449	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro, Santiago Peak
P-30-000450	CA-ORA-450	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro, Santiago Peak
P-30-000451	CA-ORA-000451	Prehistoric Archaeological Site	Lithic scatter	1973, 1982	Santiago Peak
P-30-000452	CA-ORA-000452	Prehistoric Archaeological Site	Lithic scatter, projectile points	1974, 2001	El Toro
P-30-000453	CA-ORA-000453	Multicomponent Site	Rockshelter, lithic scatter, historic carving "1887/4"	1974, 2001	El Toro

Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-000454	CA-ORA-000454	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro
P-30-000455	CA-ORA-000455	Prehistoric Archaeological Site	Lithic scatter	1974, 2001	El Toro
P-30-000456	CA-ORA-000456	Prehistoric Archaeological Site	Lithic scatter	1974, 1978, 2001	El Toro
P-30-000460	CA-ORA-000460	Prehistoric Archaeological Site	Lithic scatter	1974	El Toro
P-30-000489	CA-ORA-000489	Prehistoric Archaeological Site	Lithic scatter	1973, 1980, 2004	El Toro
P-30-000490	CA-ORA-000490	Prehistoric Archaeological Site	Lithic scatter	1973, 1982	El Toro
P-30-000491	CA-ORA-000491	Prehistoric Archaeological Site	Lithic scatter	1973, 1980, 1980	El Toro
P-30-000510	CA-ORA-000510	Prehistoric Archaeological Site	Lithic scatter	1975, 1994	El Toro
P-30-000514	CA-ORA-000514	Prehistoric Archaeological Site	Habitation site, discoidal	1976, 1977	El Toro
P-30-000536	CA-ORA-000536	Prehistoric Archaeological Site	Lithic scatter	1976	El Toro
P-30-000544	CA-ORA-000544	Prehistoric Archaeological Site	Lithic scatter	1976, 1977	El Toro
P-30-000566	CA-ORA-000566	Prehistoric Archaeological Site	Lithic scatter	1973, 1977	El Toro
P-30-000579	CA-ORA-000579	Prehistoric Archaeological Site	Shell scatter	1975	San Juan Capistrano
P-30-000594	CA-ORA-000594	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro
P-30-000602	CA-ORA-000602	Prehistoric Archaeological Site	Lithic scatter	1976, 2002	El Toro
P-30-000612	CA-ORA-000612/H	Multicomponent Site	Lithic scatter, habitation debris, and historic refuse scatter. Serrano-Whiting Adobe Site	1977	El Toro
P-30-000628	CA-ORA-000628	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro
P-30-000647	CA-ORA-000647	Prehistoric Archaeological Site	Quarry site, lithic tools and scatter	1977, 1986, 1994	El Toro
P-30-000648	CA-ORA-000648	Prehistoric Archaeological Site	Temporary habitation area	1977, 1994	El Toro
P-30-000693	CA-ORA-693	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	
P-30-000694	CA-ORA-000694	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	El Toro
P-30-000695	CA-ORA-000695	Prehistoric Archaeological Site	Lithic Scatter	1977, 1978	El Toro
P-30-000696	CA-ORA-000696	Prehistoric Archaeological Site	Habitation area, lithic scatter	1977, 1978	El Toro
P-30-000697	CA-ORA-000697	Prehistoric Archaeological Site	Lithic scatter	1977, 1978	El Toro
P-30-000698	CA-ORA-000698	Prehistoric Archaeological Site	Lithic scatter	1977	El Toro

Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-000699	CA-ORA-000699	Prehistoric Archaeological Site	Lithic scatter	1977, 1978	El Toro
P-30-000739	CA-ORA-000739	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000742	CA-ORA-000742	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000743	CA-ORA-000743	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000741	CA-ORA-000741	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000756	CA-ORA-000756	Prehistoric Archaeological Site	Lithic scatter	1978, 1996	El Toro
P-30-000773	CA-ORA-000773	Prehistoric Archaeological Site	Lithic scatter	1978	El Toro
P-30-000825	CA-ORA-000825	Prehistoric Archaeological Site	Lithic scatter	1979, 1997, 2014	El Toro
P-30-000826	CA-ORA-000826	Prehistoric Archaeological Site	Lithic scatter	1979, 1982, 1997	El Toro
P-30-000827	CA-ORA-000827	Prehistoric Archaeological Site	Lithic scatter	1979, 1995	El Toro
P-30-000828	CA-ORA-000828	Prehistoric Archaeological Site	Lithic scatter	1979, 1980	El Toro
P-30-000905	CA-ORA-000905	Prehistoric Archaeological Site	Lithic scatter	1980, 1982	El Toro
P-30-000949	CA-ORA-000949	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000950	CA-ORA-000950	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000951	CA-ORA-000951	Prehistoric Archaeological Site	Rockshelter, habitation area, midden, lithic scatter, hearth	1980	El Toro
P-30-000952	CA-ORA-000952	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000953	CA-ORA-000953	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000954	CA-ORA-000954	Prehistoric Archaeological Site	Lithic scatter, shell scatter	1980	El Toro
P-30-000955	CA-ORA-000955	Prehistoric Archaeological Site	Bedrock milling features	1980	El Toro
P-30-000957	CA-ORA-000957	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000958	CA-ORA-000958	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000959	CA-ORA-000959	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-000960	CA-ORA-000960	Prehistoric Archaeological Site	Lithic scatter	1980	El Toro
P-30-001004	CA-ORA-001004	Prehistoric Archaeological Site	Lithic scatter	1981	El Toro
P-30-001057	CA-ORA-001057	Prehistoric Archaeological Site	Rock cairn, lithic scatter	1984	El Toro

Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-001058	CA-ORA-001058	Prehistoric Archaeological Site	Rock cairn, lithic scatter	1984	El Toro
P-30-001063	CA-ORA-001063	Prehistoric Archaeological Site	Projectile point, lithic scatter	1984, 1994	El Toro
P-30-001064	CA-ORA-001064	Prehistoric Archaeological Site	Lithic scatter, hearth	1984, 1994	El Toro
P-30-001066	CA-ORA-001066	Prehistoric Archaeological Site	Lithic scatter, hearth	1984, 1994	El Toro
P-30-001097	CA-ORA-001097/H	Multicomponent Site	Lithic scatter, ruins of the Henry Serrano Adobe, and historic refuse deposit	1985	Santiago Peak
P-30-001100	CA-ORA-001100	Prehistoric Archaeological Site	Lithic scatter	1985, 1991	El Toro
P-30-001145	CA-ORA-001145	Prehistoric Archaeological Site	Lithic scatter	1988	El Toro
P-30-001146	CA-ORA-001146	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001147	CA-ORA-001147	Prehistoric Archaeological Site	Quarry, lithic scatter	1988	El Toro
P-30-001148	CA-ORA-001148	Prehistoric Archaeological Site	Lithic scatter	1988	El Toro
P-30-001149	CA-ORA-001149	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001150	CA-ORA-001150	Prehistoric Archaeological Site	Lithic scatter, hearth	1988	El Toro
P-30-001171	CA-ORA-001171	Prehistoric Archaeological Site	Lithic scatter	1988, 1994	El Toro
P-30-001242	CA-ORA-001242	Prehistoric Archaeological Site	Lithic scatter	1990	El Toro
P-30-001345	CA-ORA-001345	Prehistoric Archaeological Site	23 hearths	1992	El Toro
P-30-001362	CA-ORA-001362	Prehistoric Archaeological Site	Lithic scatter	1994	El Toro
P-30-001373	CA-ORA-001373	Prehistoric Archaeological Site	Lithic scatter	1994	El Toro
P-30-001430	CA-ORA-001430	Prehistoric Archaeological Site	Lithic scatter	1995	El Toro
P-30-001496		Historic Resource	Concrete and metal troughs, holding pen	1980	El Toro
P-30-001497		Historic Resource	Water tower	1980	El Toro
P-30-001498		Historic Resource	Metal shed	1998	El Toro
P-30-001500	CA-ORA-001500H	Historic Resource	Wood water tank	1998	El Toro
P-30-001501	CA-ORA-001501H	Historic Archaeological Site	Collapsed shed and structural debris	1998	El Toro
P-30-001728		Archaeological District	Upper Aliso Creek Archaeological District	1978, 2001	El Toro, Santiago Peak
P-30-001741	CA-ORA-001741	Prehistoric Archaeological Site	Lithic scatter	1986	El Toro

Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-100186	N/A	Prehistoric Isolate	Utilized chert flake	1977	El Toro
P-30-100187	N/A	Prehistoric Isolate	Scraper-core fragment and flake	1977	El Toro
P-30-100188	N/A	Prehistoric Isolate	Cobble and debitage	1977	El Toro
P-30-100219	N/A	Prehistoric Isolate	Granitic mano	2014	El Toro
P-30-100220	N/A	Prehistoric Isolate	Chert flake	2014	El Toro
P-30-100276	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100278	N/A	Prehistoric Isolate	Hammerstone	1980	El Toro
P-30-100279	N/A	Prehistoric Isolate	Mano	1980	El Toro
P-30-100280	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100281	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100282	N/A	Prehistoric Isolate	Mano	1980	El Toro
P-30-100283	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100285	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100288	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100289	N/A	Prehistoric Isolate	Metate	1980	El Toro
P-30-100290	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100294	N/A	Prehistoric Isolate	Core tool	1980	El Toro
P-30-100295	N/A	Prehistoric Isolate	Core	1980	El Toro
P-30-100296	N/A	Prehistoric Isolate	Flake tool	1980	El Toro
P-30-100305	N/A	Prehistoric Isolate	Utilized flake	1980	El Toro
P-30-100309	N/A	Historic Isolate	Concrete foundation/slab	1984	El Toro
P-30-100310	N/A	Prehistoric Isolate	Chert flake	1998	El Toro
P-30-100311	N/A	Prehistoric Isolate	Chopper/scraper	1984	El Toro
P-30-100312	N/A	Historic Isolate	Concrete trough	1980	El Toro
P-30-100313	N/A	Prehistoric Isolate	Quartzite core	1993	El Toro
P-30-100371	N/A	Prehistoric Isolate	Abalone shell fragment	2006	El Toro

Primary No.	Other Identifier	Site Type	Site Description	Year Recorded	Maps
P-30-100438	N/A	Prehistoric Isolate	Chert scraper	1984	El Toro
P-30-100439	N/A	Prehistoric Isolate	Mano fragment	1984	El Toro
P-30-100444	N/A	Prehistoric Isolate	Quartzite chopper	1989	El Toro
P-30-100445	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100446	N/A	Prehistoric Isolate	Metate fragment	1991	El Toro
P-30-100447	N/A	Prehistoric Isolate	Core	1991	El Toro
P-30-100448	N/A	Prehistoric Isolate	Mortar and core	1991	El Toro
P-30-100449	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100453	N/A	Prehistoric Isolate	Flake	1994	El Toro
P-30-100463	N/A	Prehistoric Isolate	2 utilized chert flakes	1991	El Toro
P-30-100464	N/A	Prehistoric Isolate	Chert flake	1991	El Toro
P-30-100491	N/A	Prehistoric Isolate	Mano fragment	2011	El Toro
P-30-156547	NR. No 76000505, CHL No. 199, HRI No. 035907, OC Historical Landmark	Historic Resource	Heritage Hill Historic Site; Serrano Adobe, :1856-1860, Bennet House (1908), El Toro School (1890), St. George's Church (1891).	1935, 1959, 1976, 1980	El Toro
P-30-176663	N/A	Historic Resource	Railroad, Aitchison-Topeka-Santa Fe	2002, 2002, 2007, 2012, 2016	El Toro, San Juan Capistrano

OTHER SOURCES

In addition to the SCCIC records search, a variety of sources were consulted in February and May 2018 to obtain information regarding the cultural context of the City of Lake Forest (Table 5). Sources included the National Register of Historic Places (NRHP) and the California Register of Historic Resources (CRHR) which includes the California Historical Resources Inventory (CHRI), California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI). The Bureau of Land Management (BLM) General Land Office records were also searched (Table 6).

Table 5. Additional Sources Consulted

Source	Results
National Register of Historic Places (NRHP/NR; 1979-2002 & supplements)	Positive: one listing, the Serrano Adobe, NR. 76000505
Historic USGS Topographic (Topo) Maps	Positive: The earliest USGS Topo map for the area is the 1901 30' Southern California Sheet no. 1 that shows the Canada de Ls Alisos Rancho the then Southern California Railroad, El Toro Road (then Los Alisos Avenue), El Camino Real, as well as the town of El Toro and the old stagecoach stop can be inferred from this Topo map. No new information can be gleaned from following Topo maps until the 1942 Santiago Peak 7.5' Topo map that shows El Toro Road (still Los Alisos Avenue at that time) as a secondary highway and shows Highway 101 as a primary highway. More development is present at old El Toro's historic downtown core. The area around Aliso Creek is symbolized as agricultural enterprises and likely included citrus orchards. The 1968 El Toro and San Juan Capistrano 7.5' Topo maps show the completed of Interstate 5 at the former location of Highway 101 and the beginning of small housing tracts near the old El Toro downtown area.
Historic US Department of Agriculture Aerial Photographs	The earliest historical aerial for the City dates to 1938 and shows numerous agricultural fields surrounding El Toro Road, then Los Alisos Avenue. Development is concentrated with old El Toro's Historic downtown core and near the area of the Serrano Adobe/Heritage Hill Area. A conspicuous feature on the landscape is Whiting experimental Eucalyptus forest, which can be seen spanning the area north of the railroad to Jeronimo Road, centered along Ridge Route. The landscape dramatically changes in the 1967 aerial with the replacement of Highway 101 with Interstate 5 and the aggressive commercial and residential development south of Jeronimo Road and north of Interstate 5. Development creeps northwest in later years.
California Historical Resources Inventory (CHRI/HRI; 1976-2014)	Positive: one listing, the Serrano Adobe HRI No. 035907
California Historical Landmarks (CHL; 1995 & supplements to 2014)	Positive: one listing, the Serrano Adobe, CHL 199

Source	Results
California Points of Historical Interest (CPHI; 1992 to 2014)	Negative
Orange County Historical Sites	Positive: one listing, Heritage Hill Historical Park
Mills Act Property Contract Program	Negative
Historic Bridges	Positive: 55C0212, Ridge Route Drive, Union Pacific:1967
Bureau of Land Management (BLM) General Land Office Records (GLO)	Positive: See Table 6
Local Historical Society, Saddleback Valley Historical Society (SVHS)	Positive: 3572 Prothero, Lake Forest. "Prothero House": 1920 23512 El Toro Rd, Lake Forest, CA 92630, Big Shots Pool Hall and El Toro Meat Market, original location of the El Toro General Store (1890s) (Figure 9).

Table 6. BLM General Land Office records.

USGS 7.5 Topographic Quad(s)	Township	Range	Section(s)	Year, Name
El Toro	5S	7W	29,	1866, Southern Pacific Railroad; 1871, Jose Serrano; 1878, Samuel Shrewsbury
			30, 31,	1871, Jose Serrano;
			32	18591, Joaquin Serrano
		8W	36	1871, Jose Serrano
	6S	7W	07, 08, 18	1866, Juan Forster
		8W	01	1871, Jose Serrano; 1868 Theodocio Yorba
			13, 23, 24	1866, Juan Forster; 1871, Jose Serrano
			22	1867 Jose Sepulveda; 1871 Jose Serrano
			01, 02, 10, 11, 12, 14, 15, 16, 21	1871, Jose Serrano
El Toro and San Juan Capistrano	6W	8W	26	1866 Juan Forster; 1871, Jose Serrano; 1875 & 1666, George Y. Barry; 1892 Charles M. Salter
			27	1871, Jose Serrano
			28	1871, Jose Serrano; 1877, 1882, State of California;
San Juan Capistrano	6W	8W	34	1871, Jose Serrano; 1883 Hiram H. & Cyrus Rawson, J.E. Bacon
			35	1871 Jose Serrano

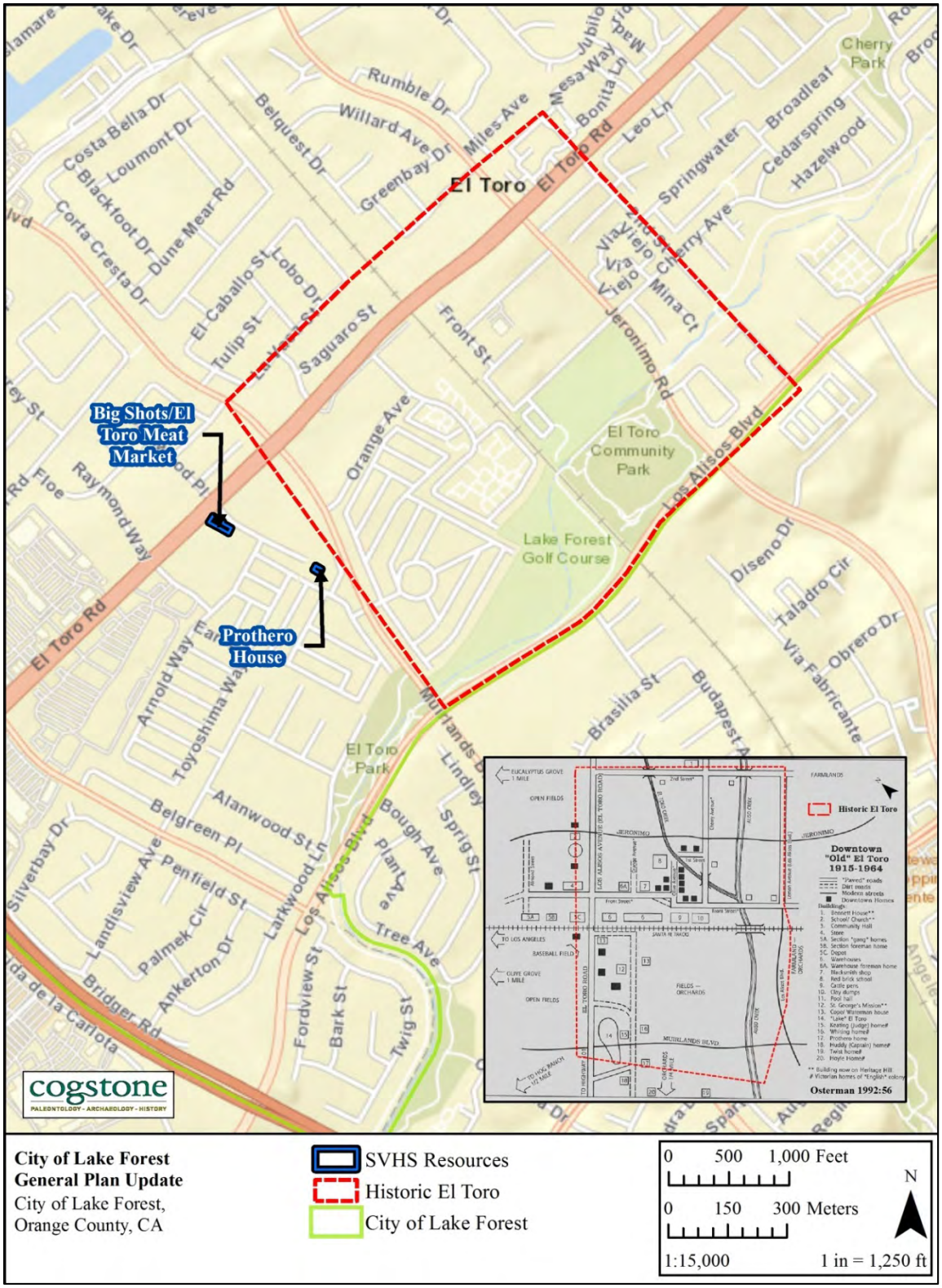

Figure 9. Historic core of "Old El Toro" showing SVHS proposed resources.

NATIVE AMERICAN CONSULTATION

A Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on March 23, 2018, the NAHC replied the same day and indicated that a search of the SFL was completed with positive results in the Santiago Peak USGS Quadrangle and that the Juaneño Band of Mission Indians should be contacted for more information about the site (Appendix F).

The City of Lake Forest conducted Native American consultations under Senate Bill 18 (Chapter 905, Statutes of 2004), also known as SB18, which requires local governments to consult with Tribes prior to making certain planning decisions and requires consultation and notice for a general and specific plan adoption or amendments in order to preserve, or mitigate impacts to, cultural places that may be affected. In addition to SB18 consultation, the City conducted tribal consultations under the provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)), also known as AB 52, which requires consulting for projects within the City of Lake Forest's jurisdiction and within the traditional territory of the Tribal Organizations who have previously requested AB52 consultations with the City. Three Tribal Organizations were contacted under AB52 and 13 were contacted under SB18.

The City of Lake Forest sent letters to all 15 Tribal Organizations on June 4, 2018 via certified mail. Follow up emails were sent on June 26, 2018, and follow up phone calls were made on July 18, 2018; however, additional contact attempts were made to the Juaneño Band of Mission Indians Acjachemen Nation. To date, four responses have been received and are summarized below, a log of all tribal consultations and related documents are located in Appendix F.

- On August 31, 2018 Ms. Joyce Perry of the Juaneño Band of Mission Indians Acjachemen Nation, via phone conversation, requested that the City of Lake Forest notify the Tribe regarding any development projects located within the City limits. She informed that the Santa Ana foothills and area around the Aliso Creek watershed are extremely sensitive for tribal cultural resources including ancestor remains.
- On August 31, 2018, Mr. Marcos Guerrero indicated that he believed the UAIC was placed on the City of Forest /Orange County list by accident.
- On June 12, 2018 Mr. Ray Teran indicated that Viejas Tribe has determined that the project has little cultural significance to the Viejas Tribe. He recommended that local Tribes be consulted.
- On July 18, 2018 the receptionist of the Jamul Indian Village indicated that the City of Lake Forest is off their reservation and outside of their traditional tribal territory and defers to local Tribes.

IMPACT ANALYSIS AND MITIGATION

The potential impacts to paleontological and cultural resources within the City of Lake Forest are discussed below. Because the General Plan Update for the City of Lake Forest does not directly address specific future projects, these impacts are described generically.

PALEONTOLOGICAL SENSITIVITY

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system (BLM 2008; Appendix E) has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria.

Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to 5 mm in diameter or less. Moreover, fossil preservation also greatly increases after natural burial in rivers, lakes, or oceans. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. So the sands, silts, and clays of rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

No formations are assigned a very high sensitivity (PFYC 5; Figures 10a and 10b). The late Eocene to early Miocene Vaqueros, Vaqueros-Sespe, and Sespe formations; the late Miocene

Monterey Formation; the late Miocene La Vida Member of the Puente Formation; and the late Miocene to early Pliocene Capistrano Formation are assigned a high sensitivity (PFYC 4).

Formations assigned a moderate but patchy sensitivity (PFYC 3a) include the Paleocene Santiago Formation, the middle Miocene Topanga Group, the Pliocene Niguel Formation, the early to middle Pleistocene very old axial-channel deposits, and the Pleistocene sections of the young axial-channel deposits. No formations are assigned a potential but not determined sensitivity (PFYC 3b).

Formations assigned a low sensitivity (PFYC 2) include the Paleocene Silverado Formation, the late Miocene Puente Formation (exclusive of the La Vida Member), Pleistocene and Holocene alluvial fan and landslide deposits, and all Holocene deposits exclusive of the modern artificial fill. Only the modern artificial fill is assigned a very low sensitivity (PFYC 1) (Table 7).

Table 7. Paleontological Sensitivity Rankings.

Age	Formation	Member	# of localities	Group										PFYC					
				terrestrial mammals	marine mammals	birds	reptiles	amphibians	bony fish	sharks and rats	invertebrates	land plants	algae	1: none	2: low	3b: potential but not determined	3a: moderate but patchy	4: high	5: very high
modern	artificial fill (Qaf)		0											X					
late Holocene	very young colluvial deposits (Qc)		0												X				
	very young landslide deposits (Qls, Qls?)		0												X				
	very young slope wash deposits (Qsw)		0												X				
Pleistocene	unlisted		29	X		X	X	X									X		
late Pleistocene to Holocene	young axial-channel deposits (Qya)		*														X		
	young alluvial-fan deposits (Qyf)		*												X				
	young landslide deposits (Qyls)		*												X				
early to middle Pleistocene	very old axial-channel deposits (Qvoa, $Qvoa_2$, $Qvoa_3$)		*														X		
	very old alluvial-fan deposits (Qvof)		*												X				
Pliocene	Niguel Formation (Tn)		4	X	X				X								X		
late Miocene to early Pliocene	Capistrano Formation	Oso Sand (Tco)	33	X	X	X	X		X	X	X	X	X					X	
		Siltstone Member (Tcs)	*															X	
		undifferentiated (Tc)	30	X	X	X	X		X	X	X							X	
late Miocene	Puente Formation	La Vida Member (Tplv)	32		X				X	X	X	X	X					X	
		Soquel Member (Tpsq)	1						X						X				
		undifferentiated (Tp)	2						X						X				
	Monterey Formation (Tm)		31		X	X	X		X	X	X	X	X					X	
middle Miocene	Topanga Group (Tt)		37	X	X	X			X	X	X							X	
latest Oligocene to latest early Miocene	Vaqueros Formation (Tv)		24		X	X	X		X	X	X							X	
	Vaqueros-Sespe Formation (Tvs)		122	X			X											X	

Age	Formation	Member	# of localities	Group										PFYC					
				terrestrial mammals	marine mammals	birds	reptiles	amphibians	bony fish	sharks and rats	invertebrates	land plants	algae	1: none	2: low	3b: potential but not determined	3a: moderate but patchy	4: high	5: very high
late Eocene to latest early Miocene	Sespe Formation (Ts)		17	X			X											X	
Paleocene	Santiago (Tsa)		15				X				X	X					X		
	Silverado	Serrano Clay bed (Tsis)	*								*	*			X				
		basal conglomerate (Tsicg)	*								*	*			X				
		undifferentiated (Tsi)	16								X	X			X				

* indicates that the number of fossils from the unit is unknown as paleontology collections may not list the unit in some cases

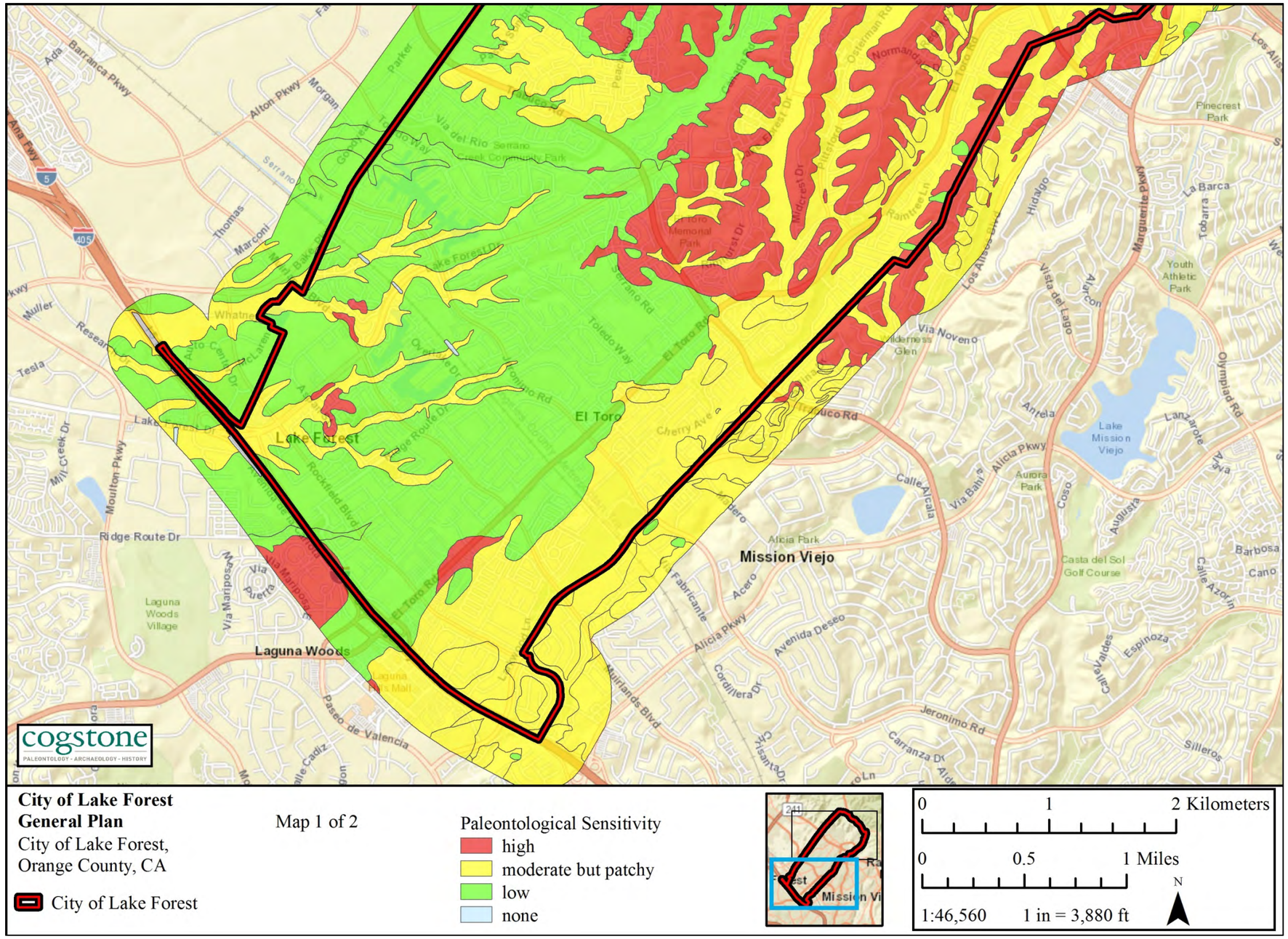

Figure 10a. Paleontological Sensitivity of the City, southwestern half.

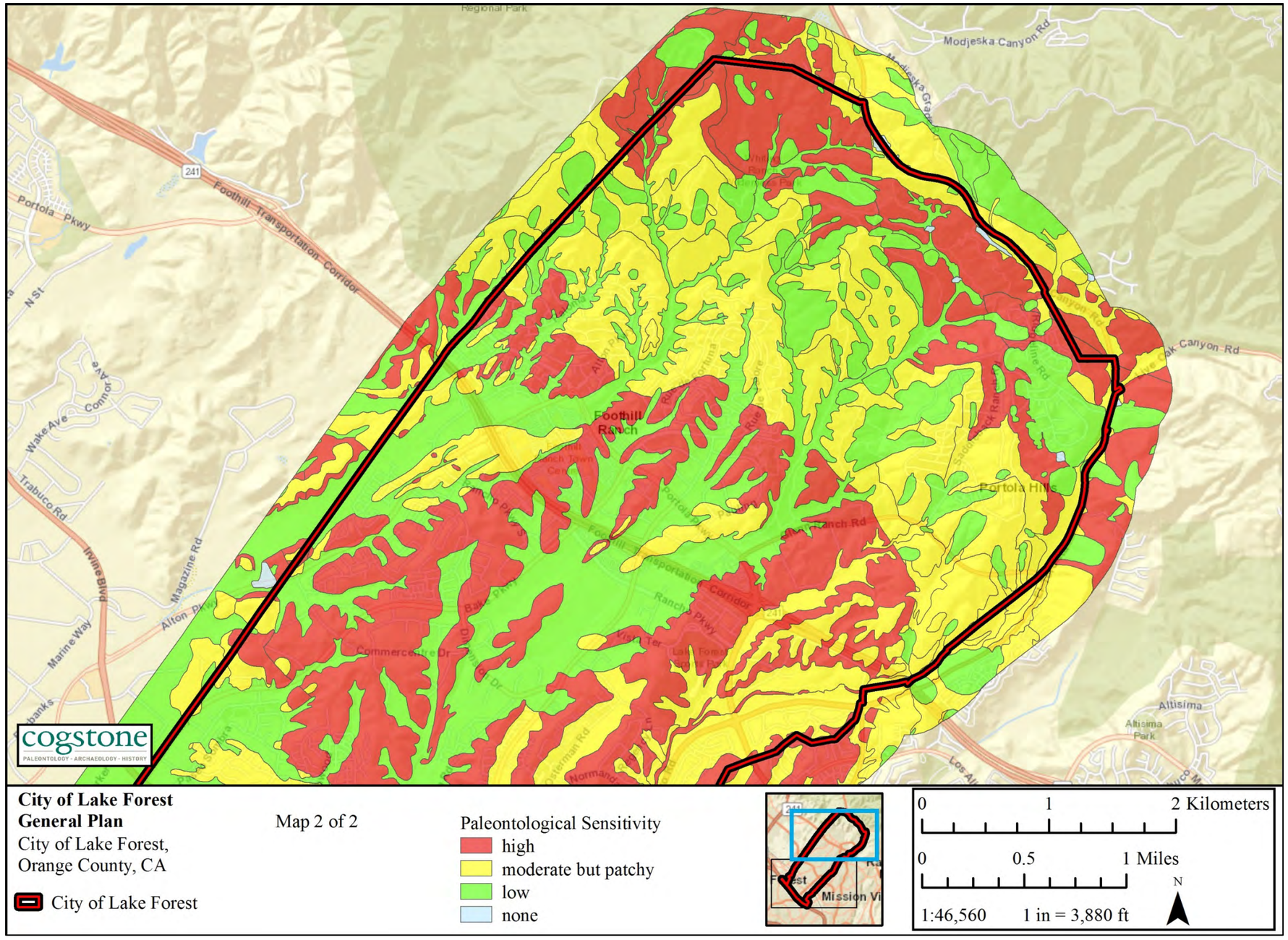

Figure 10b. Paleontological Sensitivity of the City, northeastern half.

DEFINITION OF SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.
6. All identifiable vertebrate fossils are considered significant due to the rarity of their preservation.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and invertebrate animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer 2003, Scott et al. 2004).

CULTURAL SENSITIVITY

The City of Lake Forest currently has 93 previously recorded archaeological sites and six built historic resources within the City boundaries (refer to Table 4). Additionally, the historic core of "Old El Toro" bounded by Los Alisos Boulevard to the west, Second Street to the north, El Toro Road to the east, and Muirlands Boulevard to the south has the potential to be sensitive for subsurface historic archaeological deposits. The area immediately surrounding the Aliso Creek Watershed as well as undeveloped ridge and knoll tops have the potential for subsurface prehistoric archaeological deposits.

ADVERSE CHANGES TO HISTORICAL BUILT ENVIRONMENT RESOURCES

Very few built historic structures remain within the City of Lake Forest. It is recommended that

the City of Lake Forest create and implement policies to identify, protect, and minimize adverse impacts to its remaining historical structures and features. The potential exists for significant impacts to these resources to occur as a result of development projects proposed or permitted by the City. It is recommended that the City survey, identify, inventory, and document their remaining historic resources.

ADVERSE CHANGES TO ARCHAEOLOGICAL RESOURCES

Based on what is known abundant potentially significant archeological resources are known to exist within the boundaries of the City of Lake Forest. Future projects may require ground disturbance (e.g., earthmoving activities) which may cause the destruction of significant archaeological resources, or previously unknown buried archaeological resources as defined in the CEQA Guidelines, Section 15064.5(b). As stated, a project with an effect that may cause a substantial adverse change in the significance of an archaeological resource is a project that may have a significant effect on the environment. Effects on an archaeological resource deemed to be significant could be considered adverse if they involve physical demolition, destruction, or alteration of the resource or its immediate surroundings such that the significance of a resource would be materially impaired. Thus, significant prehistoric and historical archaeological resources must be considered in the City's planning and development process, and any proposed City project that may affect significant archaeological cultural resources must be submitted to the State Historic Preservation Officer (SHPO) for review and comment prior to project approval by the City and prior to construction.

POTENTIAL TO DISTURB NATIVE AMERICAN HUMAN REMAINS

Although Native American human remains are normally associated with former residential village locations, isolated burials and cremations have been found in many other locations. Future projects may disturb or destroy buried Native American human remains, including those interred outside of formal cemeteries. Consistent with state laws protecting these remains (that is, Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98), sites containing Native American human remains must be treated in a sensitive manner.

PROPOSED MITIGATION MEASURES

MM PAL-1. City staff shall require applicants for future proposed projects with planned impacts in undisturbed sediments ranked PFYC 3 or above to provide a technical paleontological assessment consisting of a record search, survey, background context and project specific recommendations performed by a qualified paleontologist (with a graduate degree and a specialization in vertebrate paleontology). If resources are known or reasonably anticipated the recommendations shall provide a detailed mitigation plan which shall require monitoring during grading and other earthmoving activities in undisturbed sediments, provides a fossil recovery protocol that includes data to be collected, requires professional identification, radiocarbon dates

and other special studies as appropriate, requires curation at local curation facility such as such as the John D. Cooper Center operated by the County of Orange for fossils meeting significance criteria, requires a comprehensive final mitigation compliance report including a catalog of fossil specimens with museum numbers and an appendix containing a letter from the museum stating that they are in possession of the fossils.

MM CUL-1. City staff shall require applicants for future proposed projects with intact extant building(s) more than 45 years old to provide a historic resource technical study evaluating the significance and data potential of the resource. If significance criteria are met, detailed mitigation recommendations are required as part of the technical study. All work will be performed by a qualified architectural historian meeting Secretary of the Interior Standards.

MM CUL-2. City staff shall require applicants for future proposed ground disturbing projects to provide a technical cultural resources assessment consisting of a record search, survey, background context and project specific recommendations performed by a qualified archaeologist meeting Secretary of the Interior Standards and certified by the County of Orange. If resources are known or reasonably anticipated the recommendations shall provide a detailed mitigation plan which shall require monitoring during grading and other earthmoving activities in undisturbed sediments, provide a treatment plan for potential resources that includes data to be collected, requires professional identification, other special studies as appropriate, requires curation at an accredited museum such as the John D. Cooper Center operated by the County of Orange for artifacts meeting significance criteria, requires a comprehensive final mitigation compliance report including a catalog of specimens with museum numbers and an appendix containing a letter from the museum stating that they are in possession of the materials.

MM CUL-3. Unanticipated discoveries of human remains shall require immediate cessation of ground disturbance and notification to City staff and shall follow state law as stated in Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98.

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APPENDIX A. QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

DESIREÉ RENEÉ MARTINEZ
Principal Archaeologist

EDUCATION

1999 M.A., Anthropology (Archaeology), Harvard University, Cambridge
1995 B.A., Anthropology, University of Pennsylvania, Philadelphia

SUMMARY QUALIFICATIONS

Ms. Martinez is a qualified archaeologist with 21 years of experience in archaeological fieldwork, research, and curation. She has expertise in the planning, implementation, and completion of all phases of archaeological work and has participated in archaeological investigations as a crew member, tribal monitor, and principal researcher. She meets national standards in archaeology set by the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* and the standards outlined in Attachment 1 to Caltrans Section 106 Programmatic Agreement with the FHWA. Her experience also includes compliance with CEQA, NEPA, NAGPRA, SB 18 and other cultural resource laws. In addition, Ms. Martinez has vast experience in lab analysis and museum collections management. Ms. Martinez also has extensive experience consulting with Native American leaders and community members in a variety of contexts.

SELECTED PROJECTS

I-10 Grove Avenue Interchange and Grove Avenue Corridor Improvements, Caltrans District 8, Ontario, San Bernardino County, CA. Managed literature and Sacred Lands searches, Native American consultation, pedestrian survey for the 22.6 acre APE and preparation of an Archaeological Survey Report (ASR) and Paleontological Identification Report (PIR) on behalf of the City. CEQA and NHPA Section 106 compliance. 2015-2017

SR 138 Crowder Canyon Realignment Data Recovery, Caltrans District 8, Hesperia, San Bernardino County, CA. Project Manager.The project involves realignment of a ~2-mile segment of SR 138 including construction of three bridges, one lane in each direction, drainage construction and demolition of the existing segment. Cogstone participated in data recovery at two archaeological sites. All work was performed in compliance with the Caltrans SER and NEPA, CEQA, and Section 106 of NHPA. Tasks included Native American coordination, manual and mechanical excavation, backfilling, and controlled destruction. 2016-2017

Longboat Solar Photovoltaic, EDF Renewable Energy, Barstow and Lenwood, San Bernardino County, CA. Project Manager/Principal Investigator. The project was construction of a new solar facility. Managed the cultural resources assessment including Phase I and Extended Phase I studies to support MND for this ~235-acre site. Managed archaeological monitoring, Native American coordination, Phase II testing, and was co-author of the treatment plan and compliance report. 2015-2017.

Fisher House and Golf Course, Veterans Affairs Long Beach Healthcare System, Long Beach, Los Angeles County, CA. Principal Investigator. The project was preconstruction testing and monitoring for two new constructions projects. In compliance with the Historic Property Treatment Plan preconstruction work included ground penetrating radar and magnetometry, truck mounted auger testing and mechanical excavation units. One historic refuse area was defined and recorded. Monitoring recovered additional cultural materials. Co-author of compliance reports. 2015-2017.

High Desert Corridor/ SR-138 Widening Project, Caltrans District 7 On-Call (07A3145)/LA Metro, Los Angeles and San Bernardino Counties, CA. Co-Principal Investigator. This project proposed by Caltrans and Metro involves construction of a new, approximately 63-mile long, east-west freeway/expressway and rail line between SR-14 in Los Angeles County and SR-18 in San Bernardino County. Phase II/III testing and data recovery at the three sites that will be directly impacted by the project. Analyzed lithic material. Compliance with Section 106 of the NHPA and CEQA are required. 2015.

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

SHERRI GUST
Task Manager/Author

EDUCATION

1994 M. S., Anatomy (Evolutionary Morphology), University of Southern California, Los Angeles
1979 B. S., Anthropology (Physical), University of California, Davis

SUMMARY QUALIFICATIONS

Ms. Gust is an Orange County Certified Professional Paleontologist and Archaeologist and a Registered Professional Archaeologist with more than 34 years of experience in cultural resources management. She is accepted as a principal investigator for both prehistoric and historical archaeology by the State Office of Historic Preservation's Information Centers and exceeds the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. She has managed more than 650 projects at Cogstone and has a reputation for professional work, regulatory compliance and client satisfaction. She has conducted technical studies and prepared cultural resources chapters for CEQA/EIR compliance documents for project-level and program-level Specific Plans, General Plans, Master Plans, and Zoning Amendments for mixed-use, residential, commercial and industrial developments. She has expertise in research, survey, assessment of impacts/effects, significance criteria and determinations, management plans, mitigation implementation, and bone identification and analysis.

SELECTED PROJECTS

Historic Town Center Master Plan Update EIR, **San Juan Capistrano, CA.** Conducted a survey and assessment to determine the potential effects on cultural resources of potential changes to the Historic Town Center Master Plan area in support of a project-level EIR. Supervised archaeological and paleontological record searches, research, and survey plus Native American consultation for the 31-acre town center. Evaluated resources, including updated site records and impact assessment. Sub to the Templeton Planning Group. Principal Archaeologist. 2011

Los Angeles International Airport (LAX) Northside Plan Update, Los Angeles, CA. Conducted a paleontological study to determine the potential project-related effects on paleontological resources by proposed construction activities. The project consists of updating regulations for future development of facilities for employment, retail, restaurant, office, hotel, research and development, education, civic, airport support, recreation, and buffer uses within the Northside area of the LAX Specific Plan. The work was performed on behalf of Los Angeles World Airports under subcontract to URS Corporation. Principal Paleontologist.2012

Chino Hills General Plan EIR, San Bernardino County, CA. Performed archaeological and paleontological record searches, Native American consultation, and prepared assessment report for the City of Chino Hills under subcontract to Comprehensive Planning. This study was conducted to provide available information on paleontological and cultural resources to support an update of the General Plan program-level environmental documents. The City consists of 28,723 acres. The work was performed on behalf of the City of Chino Hills under subcontract to Comprehensive Planning Services. Principal Archaeologist. 2010

Yucca Valley General Plan Update EIR, Town of Yucca Valley, San Bernardino, CA. Conducted a paleontological and cultural resources assessment of the Town's 25,470 acres with programmatic mitigation measures in support of the General Plan Update Environmental Documents on behalf of the Town of Yucca Valley under subcontract to The Planning Center. The project involved record searches, sacred lands search, Native American consultation, and a final report. Principal Archaeologist and Paleontologist. 2012

KIM SCOTT
Principal Investigator for Paleontology

EDUCATION

2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino
2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles

SUMMARY QUALIFICATIONS

Scott has more than 20 years of experience in California paleontology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Purple Line Extension (Westside Subway), Metro/FTA, Los Angeles. The project involves extension of the subway from Wilshire/Western to the VA Facility in Westwood for 9 miles. Cogstone prepared the supplemental Archaeology and Architectural History Reports and the cultural and paleontological sections of the FEIS/FEIR. Cogstone subsequently prepared the cultural and paleontological mitigation and monitoring plans for the entire project. Currently providing monitoring and all other cultural and paleontological services for Section One of the project. Paleontological Field and Lab Director, Report Co-author. 2011-present

Barren Ridge Transmission Line, Los Angeles Department of Water and Power (LADWP), Saugus to Mojave, Los Angeles and Kern Counties, CA. Over 75 miles of LADWP electrical lines were installed Angeles National Forest, BLM and private lands. Supervised paleontological monitoring and lab work and prepared a Paleontological Monitoring Report to CEQA, BLM and PRPA standards. Sub to Aspen Environmental Group. Principal Paleontologist. 2015-2017.

Dola and Lanzit Bridges, San Bernardino County Department of Public Works, CA. Reviewed previous studies: paleontological assessment, paleontological mitigation measures, and geotechnical report. Conducted a field survey and prepared Paleontological Resources Management and Monitoring Plan to CEQA and county standards to more accurately reflect the project needs when compared to the mitigation measures. Subsequently provided monitoring and a compliance report. Contracted to ECORP. Principal Paleontologist. 2016- 2017.

Perris Valley Line Rail Improvements, Riverside County Transportation Commission (RCTC), Riverside County, CA. RCTC added a second track and other modifications of 22 miles of the Perris Valley line from Highgrove, south through Riverside, south and east through Moreno Valley and south through to Perris to link this area to the MetroLink rail service. Performed a field survey and prepared an abbreviated Paleontological Resource Assessment to CEQA standards. Supervised all paleontological monitoring and prepared a Paleontological Monitoring Report to CEQA standards. Sub to HDR Engineering. Principal Paleontologist. 2014-2016.

Elvira to Morena Double Track, San Diego Associate of Governments (SANDAG), San Diego County, CA. SANDAG improved a 10.3 mile stretch of the line with double track and other modifications from Control Point (CP) Elvira to CP Moreno. Project development will be closely coordinated with the Mid-Coast LRT Project, California High Speed Rail (Los Angeles to San Diego) and the Rose Canyon and Coastal Rail Trail Projects. Author of a Paleontological Resources Report addressing potential impacts and mitigation measures to CEQA standards. Supervised paleontological monitoring of Rose Canyon. Sub to HDR Engineering. Co-Principal Paleontologist/Report Co-author. 2012-2015.

MEGAN PATRICIA WILSON, RPA
Archaeologist

EDUCATION

2014 M.A. Anthropology, California State University, Fullerton *cum laude*
2013 GIS Certificate, California State University, Fullerton
2006 B.A., Anthropology, University of California, Los Angeles *cum laude*

SUMMARY QUALIFICATIONS

Ms. Wilson is a Registered Professional Archaeologist (RPA) and cross-trained paleontologist. Ms. Wilson regularly conducts records searches, tribal consultations, completes DPR site records, and gathers historic building information from local municipalities, and assists in drafting archaeological assessment reports for state, federal, and private development projects. She meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. Further, she is certified in Geographic Information Systems (GIS) and specializes in ESRI's ArcGIS software. Ms. Wilson is responsible for supervising GIS data collection and management, geospatial analysis, and the production of GIS maps and databases for large and small-scale projects. Ms. Wilson has seven years of experience in southern California archaeology.

SELECTED PROJECTS

Park Place Extension and Grade Separation EIR EA, Caltrans District 7, El Segundo, Los Angeles County, CA. Conducted a pedestrian survey to record and evaluate cultural resources within the archaeological and architectural APEs for a ~0.5-mile project along NBSF and UPRR rail lines and spur tracks on behalf of the City of El Segundo for HPSR/ASR/HRER and paleontological reports. Seven built-environment resources were identified, evaluated, and DPR 523 forms were prepared. Archaeologist. 2017

Whittier Boulevard / I-605 Arterial Hot Spot Improvements, Environmental Clearance and Preliminary Engineering for Three Intersection Improvements, Whittier, Los Angeles County, CA. Conducted an intensive-level cultural resources survey to support cultural and paleontological resources technical studies for improvements proposed for three intersections in a disturbed urban environment. Drafted APE maps, records search, Sacred Lands search, and NAHC consultation for intersections at Colima Road, Santa Fe Springs Road and Painter Avenue. Archaeologist. 2016

Hidden Oaks Country Club Specific Plan and TT 18869, Chino Hills, San Bernardino County, CA. Prepared report maps, conducted cultural and paleontological resources assessments and assisted the City with SB 18 compliance. Services included records search, drafting project maps, Sacred Lands search, NAHC consultation, field survey, and mitigation recommendations. Cogstone responded to the cultural section of the project EIR comment for this proposed 537-acre residential. Archaeologist. 2015-2016

On-Call Cultural Resources Services, Sanitation Districts of Los Angeles County, CA. Prepared APE maps, conducted record searches, NAHC consultation, field surveys, and prepared DPR forms to support upgrades and improvements to pipelines at Mesquite Landfill, Clearwater, and Santa Clarita facilities. Archaeologist. 2015-2016

Accelerated Charter Elementary School, Los Angeles Unified School District, Los Angeles, Los Angeles County, CA. The project involves documentation of five historic-age buildings prior to demolition, background research, mitigation monitoring plans, archaeological and paleontological monitoring and preparation of a monitoring compliance report. LAUSD is constructing a new facility on a 2.3-acre site in South Central Los Angeles consisting of classrooms, open areas and parking. Drafted project related maps, conducted background research and contributed to preparation of DPR forms. Archaeologist. 2015

Sweany Pipeline, Phase II, Laguna Beach County Water District, Orange County, CA. Completed a cultural resources assessment; conducted archaeological/paleontological records search, NAHC consultation, and drafted project maps for inclusion in a CEQA environmental document. Archaeologist. 201

APPENDIX B. PALEONTOLOGICAL RECORDS SEARCH RESULTS

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

5 April 2018

Cogstone Resource Management, Inc.
1518 West Taft Avenue
Orange, CA 92865-4157

Attn: Megan Wilson, Archaeologist & GIS Technician

re: Vertebrate Paleontology Records Check for paleontological resources for the proposed City of Lake Forest General Plan Update Project, Cogstone Project # 4050, in the City of Lake Forest, Orange County, project area

Dear Megan:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed City of Lake Forest General Plan Update Project, Cogstone Project # 4050, in the City of Lake Forest, Orange County, project area as outlined on the portions of the El Toro, San Juan Capistrano, and Santiago Peak USGS topographic quadrangle maps that you sent to me via e-mail on 22 March 2018. We have several vertebrate fossil localities that lie directly within the proposed project area boundaries, and we have other localities nearby from the same sedimentary deposits that occur within the proposed project area.

Surface deposits in the lower lying terrain in much of the southwestern portions of the proposed project area consist of younger Quaternary Alluvium, derived as alluvial fan deposits from the hills of the Santa Ana Mountains to the northeast and east via Borrego Canyon Wash in the north, Serrano Creek in the central portion, and Aliso Creek in the south. These deposits typically do not contain significant vertebrate fossils in the very uppermost layers, but at relatively shallow depth they may be underlain with older sedimentary deposits that do contain significant vertebrate fossils. In the slightly elevated terrain in most of the southwestern portion of the proposed project area older Quaternary terrace deposits occur at the surface, and similar deposits may underlie the younger Quaternary deposits exposed in adjacent portions of the proposed project area.

Inspiring wonder, discovery and responsibility for our natural and cultural worlds.

Geological mapping indicates that in the hills east of the Borrego Canyon Wash near the northwestern border of the proposed project area there are relatively small exposures of the marine middle to late Miocene Monterey Formation and even smaller exposures of the marine Pliocene Niguel Formation. The elevated terrain in most of the central portion of the proposed project area though has exposures of the Oso Sand Member of the marine late Miocene Capistrano Formation.

The northeastern portion of the proposed project area has exposures of a succession of older rock units. Proceeding northeastward from younger to older these are the Soquel Member followed by the La Vida Member of the marine late Miocene Puente Formation, the marine middle Miocene Topanga Formation, the marine late Oligocene to early Miocene Vaqueros Formation that interfingers with the terrestrial late Oligocene to early Miocene Sespe Formation, and the marine Eocene Santiago Formation. From geologic mapping it appears that exposures of the marine Paleocene Silverado Formation occur adjacent to but not within the proposed project area.

Our closest fossil locality in older Quaternary sediments is LACM 65129, just southeast of the southeastern-most portion of the project area in what is now Costeau Park. Locality LACM 65129 produced an extensive fauna of predominately terrestrial vertebrates (see faunal list in the appendix). W. E. Miller (1971. Pleistocene vertebrates of the Los Angeles basin and vicinity (exclusive of Rancho La Brea). Science Bulletin, Natural History Museum of Los Angeles County, 10:1-124) described this site as Costeau Pit and figured or published on most of the taxa known at that time.

We have one Niguel Formation locality, LACM 7058, that occurs either within or adjacent to the southeastern-most point of the proposed project area in Aliso Creek immediately north of the San Diego Freeway (I-5). Locality LACM 7058 contained fossil specimens of six-gilled shark, *Hexanchus*, and bony fish, Osteichthyes. Our closest locality that includes fossils from both the terrestrial Quaternary Terrace deposits and the marine Pliocene Niguel Formation is LACM 7131, almost due east of the southeastern-most point of the proposed project area east of the San Diego Freeway (I-5) and north of La Paz Road in Mission Viejo, that produced fossil specimens of camel, Camelidae, and sea lion, Otariidae. Other nearby Niguel Formation localities just southeast of the proposed project area include LACM 65187, north of La Paz Road west of the San Diego Freeway (I-5), that produced fossil specimens of giant white shark, *Carcharocles megalodon*, and whale, Cetacea; LACM 5551, south along La Paz Road west of the San Diego Freeway (I-5), that produced fossil specimens of sea cow, Dugongidae, early baleen whale, *Herpetocetus*, and sea lion, Otariidae; and LACM 3804, immediately south of Oso Parkway approximately one half mile west of the San Diego Freeway (I-5), that contained specimens of the fossil white shark, *Carcharodon sulcidens*.

We have a number of localities from the Capistrano Formation that occur within the boundaries of the central portion of the proposed project area: LACM 3199, 3218, 3221, 3410-3411, 3491, 4177, 4666-4668, 5500, 7370-7372, and 7546-7547. These Capistrano Formation localities have produced a suite of predominately marine vertebrates and a few terrestrial vertebrates including giant white shark, *Carcharocles megalodon*, bonito sharks, *Isurus hastalis*

and *Isurus oxyrinchus*, salmon shark *Lamna*, eagle ray, *Myliobatis*, sturgeon, *Acipenser*, parrotfishm Scaridae, halibut, *Paralichthys*, sabretoothed salmon, *Oncorhynchus rastrosus*, crocodile, Crocodylidae, leatherback turtle, *Psephophorus*, tortoise, *Geochelone*, puffin, Mancallinae, otter, *Satherium*, false walrus, *Gomphotaria pugnax*, sea lion, *Imagotaria*, dugong, Dugongidae, horse, *Pliohippus*, rhinoceros, Rhinocerotidae, right whale, Balaenidae, rorqual whale, Balaenopteridae, primitive baleen whale, *Herpetocetus*, sperm whale, Physeteridae, and camel, Camelidae. Specimens of the sturgeon, *Acipenser*, from locality LACM 3221 were published in the scientific literature by E. J. Hilton and L. Grande (2006. Review of the fossil record of sturgeons, family Acipenseridae (Actinopterygii: Acipenseriformes), from North America. Journal of Paleontology, 80(4):672-683). A specimen of the false walrus, *Gomphotaria pugnax*, from locality LACM 4177 was published in the scientific literature by J. Velez-Juarbe in 2017 (*Eotaria citrica*, *sp. nov.*, a new stem otariid from the "Topanga" formation of Southern California. PeerJ, 5(3022):1-25).

We have a great many vertebrate fossil localities in southern California from the Puente Formation but only one, LACM 6287, from Orange County. Locality LACM 6287, situated north of the western portion of the proposed project area southeast of Santiago Reservoir along Santiago Canyon Road in Limestone Canyon, produced fossil specimens of tonguefish, *Symphurus*.

We have a number of Monterey Formation localities that occur in the southwestern portion of the proposed project area: 3198, 3486, 3209-3210, 3412-3413, and 4103-4114. These localities produced a suite of fossil marine vertebrates including hammerhead shark, *Sphyrna*, giant white shark, *Carcharocles megalodon*, bonito sharks, *Isurus benedeni* and *Isurus oxyrinchus*, bramble shark, *Paraechinorhinus barnesi*, eel, Anguilliformes, jack, Carangidae, bonito, *Sarda*, barracuda, *Sphyraena*, crocodile, *Crocodylus*, bird, Aves, sea lion, Otariidae, dugong, *Dioplotherium allisoni*, baleen whale, Mysticeti, and dolphin, Kentriodontidae. A specimen of the dugongid sirenian *Dioplotherium allisoni* from locality LACM 3210 was figured in the scientific literature by D. P. Domning in 1978 (Sirenian Evolution in the North Pacific Ocean. University of California Publications in Geological Sciences, 118:1-176). Specimens of the fossil crocodile *Crocodylus* from localities LACM 3209 and 3210 were published in the scientific literature by C. A. Brochu in 1999 (Phylogenetics, Taxonomy, and Historical Biogeography of Alligatoroidea. Journal of Vertebrate Paleontology, 19(2):9-100). F. H. Pfeil designated the holotype (name bearing specimen for a species new to science) of the echinorhinid shark *Paraechinorhinus barnesi* from locality LACM 3198 (1983. Zahnmorphologische Untersuchungen an rezenten und fossilen Haien der Ordnungen Chlamydoselachiformes und Echinorhiniformes. Palaeoichthyologica. 1:1-315).

Our closest vertebrate fossil locality from the Topanga Formation is LACM 5511, just outside the eastern-most border of the proposed project area near Cook's Corner, that produced a specimen of the fossil dugong *Metaxytherium arctodites* figured in the scientific literature by F. J. Arranda-Manteca in 1994 (A New Middle Miocene Sirenian of the Genus *Metaxytherium* from Baja California and California: Relationships and Paleobiogeographic Implications. Proceedings of the San Diego Society of Natural History, 29:191-204). Further south of LACM 5511 we have the Topanga Formation locality LACM 7200, that produced a fossil specimen of the peculiar and extinct four-legged marine mammal, *Desmostylus*.

We have several vertebrate fossil localities from the Topanga Formation around the Oso Dam just east of the central portion of the proposed project area including LACM 4464, 4545-4552, 4556-4558, 4961, and 5494-5496. These localities produced a suites of marine vertebrates including smoothhound shark, *Mustelus*, horn shark, *Heterodontus*, bonito shark, *Isurus hastalis*, eagle ray, Myliobatidae, guitarfish, *Rhinobatos*, eel, Anguilliformes, surgeonfish, *Prionurus*, leatherback turtle, Dermochelyidae, duck, Anatinae, auklet, *Alcodes ulnulus*, booby, Sulidae, albatross, *Diomedea milleri*, shearwater, *Puffinus priscus*, sea lions, *Allodesmus*, *Eotaria citrica*, *Neotherium*, and *Pelagiarctos*, four-legged marine mammal, *Desmostylus*, primitive baleen whale, Cetotheriidae, and primitive dolphin, *Lamprolithax*. Specimens of the fossil birds from these localities were figured or published in the scientific literature by H. Howard and L. G. Barnes in 1987 (Middle Miocene Marine Birds from the Foothills of the Santa Ana Mountains, Orange County, California. Contributions in Science, Natural History Museum of Los Angeles County, 383:1-9). In 2017 J. Velez-Juarbe designated the holotype of the new fossil sea lion species *Eotaria citrica* from locality LACM 4546 and also published on specimens of the fossil sea lions *Allodesmus* and *Pelagiarctos* from these localities (*Eotaria citrica, sp. nov.*, a new stem otariid from the "Topanga" formation of Southern California. PeerJ, 5(3022):1-25).

Further south of the Oso Dam, but still along Oso Creek, our Topanga Formation locality LACM 5769 produced a fossil specimen of great white shark, *Carcharocles megalodon*. Southeast of the southeastern part of the proposed project area, in Mission Viejo east of Oso Creek, our Topanga Formation locality LACM 6064 produced fossil specimens of desmostylian, *Paleoparadoxia*, and sea lion, *Eotaria crypta*. The *Paleoparadoxia* specimen was published in the scientific literature by A.I. Panofsky in 1998 (Stanford *Paleoparadoxia* Fossil Skeleton Mounting. Stanford Linear Accelerator Center Publication, 7829:1-143). The *Eotaria crypta* specimen was figured in the scientific literature by J. Velez-Juarbe in 2017 (cited above).

The Sespe and Vaqueros Formations intergrade and interdigitate so that they are often difficult to distinguish and then they are typically referred to as the Sespe / Vaqueros Formations undifferentiated. We have one Sespe / Vaqueros Formation locality, LACM 5448, that occurs either within the proposed project area or adjacent to the central western border in the hills immediately east of Borrego Canyon Wash. Fossil specimens of undetermined bird, Aves, and whale, Cetacea, were recovered from locality LACM 5448.

Just north of the northern-most border of the proposed project area, between Bolero Lookout and Santiago Canyon Road, our Sespe / Vaqueros locality LACM (CIT) 449, produced a suite of both marine and terrestrial fossil vertebrates including horn shark, *Heterodontus*, requiem shark, *Carcharhinus*, tiger shark, *Galeocerdo*, bonito shark, *Isurus*, megamouth shark, Megachasmidae, eagle rays, *Myliobatis*, sea turtle, Cheloniidae, horse, *Parahippus pawniensis*, extinct pig-like artiodactyl, *Daeodon hollandi*, camel, cf. *Michenia*, baleen whale, Mysticeti, and toothed whale, Odontoceti, published in the scientific literature by S.G. Lucas et al. (1997. Giant Entelodont (Mammalia, Artiodactyla) from the Early Miocene of Southern California. LACM Contributions in Sciences, 466:1-9).

Around Oso Dam just east of the central portion of the proposed project area we have several localities from the Sespe / Vaqueros Formations including LACM 4553-4555, 4559-4560, 5146-5147, and 5497. The terrestrial facies localities LACM 4553-4554 produced fossil specimens of

turtle, Testudinata, opossum, *Peratherium*, rabbit, *Archaeolagus*, *deer mouse, Yatkolamys*, pocket mouse, *Trogomys*, and badger, Mustelidae. The marine facies locality LACM 4559 produced fossil specimens of dusky shark, *Carcharhinus*, tiger shark, *Galeocerdo*, snaggletooth shark, *Hemipristis*, daggernose shark, *Isogomphodon*, smoothhound, *Mustelus*, horn shark, *Heterodontus,* basking shark, *Cetorhinus*, stingray, *Dasyatis*, devli ray, *Mobula*, eagle ray, *Myliobatis*, nurse shark, *Ginglymostoma*, skate, *Raja*, guitarfish, *Rhinobatos*, wedgefish, *Rhynchobatus*, sawfish, *Pristiophorus*. dogfish, *Squalus*, angel shark, *Squatina*, herring, Clupeidae, bonefish, Albulidae, beakfish, Oplegnathidae, swordfish, *Cylindracanthus*, and triggerfish, Balistidae.

All of our fossil vertebrate localities from the Santiago Formation, LACM 3881, 3883-3884, 3979, 4022, 5346-5347, 6926 and 68102, occur much to the south of the proposed project area in the northwestern part of San Diego County, clustered around Carlsbad. These localities produced a suite of vertebrate fossils including turtles, crocodiles, birds, rodents, insectivores, brontothere, and amynodont rhinoceroses. David J. Golz (1976. Eocene Artiodactyla of Southern California. Los Angeles County Museum Science Bulletin, 26:1-85) published on the LACM specimens of the protoceratid artiodactyl *Leptoreodon leptolophus* and the camels *Protylopus petersoni* and *Protylopus stocki* from our Santiago Formation locality LACM 68102.

Shallow excavations in the younger Quaternary Alluvium exposed in the lowest lying terrain and the drainages of the proposed project area are unlikely to uncover significant fossil vertebrate remains. Deeper excavations in those younger Quaternary deposits that extend down into older Quaternary deposits, however, as well as any excavations in the exposures of older Quaternary terrace deposits, the Niguel Formation, the Capistrano Formation, the Puente Formation, the Monterey Formation, the Topanga Formation, the Sespe / Vaqueros Formations undifferentiated, or the Santiago Formation, may well encounter significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossil materials uncovered during mitigation activities should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosures: appendix, invoice

Fauna from Emery Borrow Pit - LACM 65129

Chondrichthyes
- Lamniformes
  - Lamnidae - mackerel sharks
    - *Carcharocles*
    - *Carcharodon sulcidens*
    - *Isurus*

Osteichthyes
- Perciformes
  - Labridae - wrasse
    - *Pimelometopon*

Amphibia
- Anura
  - Bufonidae - toad
    - *Bufo*
  - Ranidae - frog
    - *Rana*
- Urodela
  - Plethodontidae - salamander
    - *Aneides lugubris*

Reptilia
- Squamata
  - Crotalidae - rattlesnake
    - *Crotalus*
  - Phrynosomatidae - spiny lizard
    - *Sceloporus*
  - Teiidae - whiptail lizard
    - *Cnemidophorus*
- Testudinata
  - Emydidae - pond turtle
    - *Clemmys*
  - Testudinidae - tortoise
    - *Gopherus*

Aves
- Accipitriformes
  - Accipitridae - hawk
    - *Buteogallus*
- Anseriformes
  - Anatidae - ducks
    - *Anas*
- Charadriiformes
  - Burhinidae - stone curlew

Aves (continued)
- Columbiformes
  - Columbidae - pigeon
- Galliformes
  - Phasianidae - quail
    - *Lophortyx*
- Gruiformes
  - Rallidae - coot
    - *Fulica americana*
- Passeriformes
  - Corvidae - crow
  - Fringillidae - finch
  - Hirundinidae - swallow
  - Icteridae - blackbirds
  - Turdidae - thrush
- Strigiformes
  - Strigidae - burrowing owl
    - *Speotyto*
  - Tytonidae - barn owl
    - *Tyto alba*

Mammalia
- Artiodactyla
  - Antilocapridae - pronghorn
    - *Capromeryx*
  - Bovidae - bison
    - *Bison antiquus*
    - *Bison latifrons*
  - Camelidae - camels
    - *Camelops hesternus*
    - *Tanupolama*
  - Cervidae - deer
  - Tayassuidae - peccary
    - *Platygonus*
- Carnivora
  - Canidae - dogs
    - *Canis dirus*
    - *Canis latrans*
  - Felidae - cats
    - *Felis concolor*
    - *Smilodon californicus*
  - Mustelidae - weasel
    - *Mustela frenata*
- Insectivora
  - Soricidae - shrew
    - *Notiosorex crawfordi*

Mammalia (continued)
- Lagomorpha
  - Leporidae - rabbits
    - *Lepus californicus*
    - *Sylvilagus audubonii*
    - *Sylvilagus bachmani*
- Perissodactyla
  - Equidae - horse
    - *Equus*
- Proboscidea
  - Elephantidae - mammoth
    - *Mammuthus columbi*
- Rodentia
  - Cricetidae - voles & rats
    - *Microtus californicus*
    - *Neotoma*
    - *Ondatra*
    - *Peromyscus maniculatus*
    - *Reithrodontomys humulis*
  - Geomyidae - pocket gopher
    - *Thomomys bottae*
  - Heteromyidae - pocket mice
    - *Dipodomys*
    - *Perognathus californicus*
  - Sciuridae - squirrel
    - *Spermophilus beecheyi*
- Xenarthra
  - Mylodontidae - ground sloth
    - *Paramylodon harlani*

APPENDIX C. FOSSIL LOCALITY DATA

PALEOCENE SILVERADO FORMATION

17 localities, none in the City of Lake Forest

Common Name	Taxon	locality #	Location	# of localities	Within City?	Reference
marine snails and bivalves	numerous	Report # F83-F99	Black Star Cyn 7.5' topo- 16 localities; Orange 7.5' topo- 1 locality;	16	no	Schoellhamer et al. 1981
willow leaf?	?*Salix* sp.	OCPC 02267	ETC, El Toro 7.5' topo	1	no	OCPC 2018
dicot leaf	Dicotyledonae					

PALEOCENE SANTIAGO FORMATION

20 localities, none in the City of Lake Forest

Common Name	Taxon	locality #	Location	# of localities	Within City?	Reference
marine snails and bivalves	numerous	Report # F99a-F99b, F100-F114, F114a-F114b	Black Star Cyn 7.5' topo- 11 localities; El Toro 7.5' topo- 4 localities; Orange 7.5' topo, 3 localities; Tustin 7.5' topo, 1 locality	19	no	Schoellhamer et al. 1981
crocodyle	Crocodylidae	OCPC 02259	ETC, Black Star Cyn 7.5' topo	1	no	OCPC 2018
magnolia	*Magnolia* sp.					
laural	*Laurus* sp, cf. *Laurus* sp.					
pea plant	?*Dryophyllum* sp., Fabaceae					
walnut	*Juglans* sp.					
fig	†"*Ficus" amballi, "Ficus"* sp.					
willows	†*Idesia cordata, Idesia polycarpa, Idesia sp.*, ?*Salix* sp.					
plant	?Lamonia					
katsura	cf. *Cercidiphyllum* sp.					
dicot	Dicotyledonae					

LATE EOCENE TO EARLY MIOCENE SESPE FM.

17 localities, none in the City of Lake Forest

Locality	Location	In City?	Reference
LACM 7327, 7341	Lower Bowerman Landfill	no	Whistler and Lander 2003
LACM 6935-6939, 6942-6945	Upper Bowerman Landfill	no	Whistler and Lander 2003
LSA SR-73	San Joaquin Hills	no	Whistler and Lander 2003
LC 196, 199, 202, 204	Foothill Transportation Corridor/ Oso segment	no	Whistler and Lander 2003
OCPC 2030	El Toro USGS 7.5' topo	no	OCPC 2018

EARLY MIOCENE VAQUEROS - SESPE FM.

122 localities

Locality	Location	In City?	Reference
LACM (CIT) 449	between Bolero Lookout and Santiago Cyn Road	yes	McLeod 2018
LACM 4553-4555, 4559-4560, 5146-5147, 5497	Oso Dam	no	McLeod 2018
LACM 5448	Borrego Canyon Wash	possibly	McLeod 2018
LACM 6927- 6930	Parkridge, Santa Ana Mtns.	no	Whistler and Lander 2003
LC 151, 162-174, 194	Santiago Canyon Landfill	no	Whistler and Lander 2003
OCPC 2015-2020, 2037-2040, 2059-2063, 2065-2067, 2077, 2099-2100, 2109, 2112, 2117, 2132-2134, 2156-2158, 2160, 2162-2170, 2173-2175, 2178, 2249, 2257	Blackstar Canyon USGS 7.5' topo	no	OCPC 2018
OCPC 2010-2012, 2027, 2073-2075, 2083-2084, 2088, 2096, 2102-2103, 2106-2108, 2111, 2122, 2125-2126, 2172, 2176, 2251, 2260, 2265-2267	El Toro Canyon USGS 7.5' topo	no	OCPC 2018
OCPC 2008-2009, 2013-2014, 2021-2024, 2031-2032, 2085, 2089-2090, 2104, 2113-2114, 2127	Orange USGS 7.5' topo	no	OCPC 2018
USGS 18445, 18451, 18454, 18459, 18461, 18462, 18469, 18470, 18472, 18477, 18996	Santa Ana Mountains	no	Schoellhamer et al. 1981
F138 Palomar College	Santa Ana Mountains	no	Schoellhamer et al. 1981
F130, F132	Santa Ana Mountains	no	Schoellhamer et al. 1981

Terrestrial Animals: Sespe Formation and Vaqueros-Sespe Formation

Common Name	Taxon	Sespe	Vaqueros -Sespe
bear-dogs	†*Cynelos* cf. *C. helbingi*		X
	†*Cynelos malasi*		X
	†*Cynelos* sp.		X
bone-crushing dogs	†*Cynarctoides gawnae*		X
	†*Cynarctoides whistleri*		X
	†*Phlaocyon taylori*	X	
	†*Phlaocyon* sp.	X	X
canid	†*Leptocyon vulpinus*	X	
	†cf. *Leptocyon* sp.		X
bears	†?*Cephalogale* sp.		X
	†*Phoberogale shareri*		X
weasel	Mustelidae	X	X
rhinoceros	†*Menoceras barbouri*		X
	†Rhinocerotidae		X
horses	†?*Kalobatippus clarancei*		X
	†*Parahippus pawniensis*		X
peccary	†?*Cynorca* sp.	X	X
pig-like artiodactyl	†*Daeodon hollandi*		X
oreodonts	†*Sespia nitida*	X	X
	†*Merychyus elegans*		X
	†*Merychyus* sp.	X	X
	†Merycoidodontidae		X
camels	†*Michenia agatensis*	X	X
	†*Tanymykter brachyodontus*		X
	†?*Tanymykter* sp.	X	X
	†Camelidae		X
deer-like artiodactyl	†Palaeomerycidae		X
musk deer	†?*Nanotragulus ordinatus*	X	X
	†*Machaeromeryx tragulus*	X	X
	†*Machaeromeryx* sp.		X
	†*Pseudoblastomeryx advena*		X
hedgehogs	†*Sespedectes singularis*		X
	†*Sespedectes* sp.		X
	†Erinaceidae		X
shrews	†Heterosoricidae	X	X
	Soricidae		X
pikas	†*Cuyamalagus dawsoni*	X	X
	†*Cuyamalagus sp.*		X
	†?*Gripholagomys* sp.	X	X
rabbit	†*Archaeolagus* sp.		X
chipmunks	†*Nototamias* sp.	X	X
	†*Tamias* sp.		X
squirrels	†*Miospermophilus* sp.	X	X
	†?*Petauristodon* sp.	X	X
vesper rodents	†*Hesperomys (Ledimys) nematodon*	X	X
	†*Ledimys* sp.	X	X
cricetid rodents	†*Trogomys* sp.	X	X
	†*Yatkolamys* sp.		X
paramyid rodents	†*Leptotomus* sp.		X
	†*Microparamys* sp.		X

Common Name	**Taxon**	**Sespe**	**Vaqueros -Sespe**
relative of pocket gophers/ kangaroo rats/ pocket mice	†*Cupidinimus* near *C. lindsayi*		X
	†*Griphomys*sp.		X
	†*Heliscomys* sp.	X	X
	†*Proheteromys* sp.	X	X
	†*Pseudotheridomys cuyamensis*		X
	†*Pseudotheridomys* sp. (large)		X
	†*Schizodontomys* sp.	X	X
simimyid rodents	†*Simimys simplex*		X
	†*Simimys* sp.		X
opossums	†*Herpetotherium* sp.	X	X
	†*Peratherium sp.*		X
iguana	*Parasauromalus* sp.	X	
boa	Boidae		X
turtle	Testudinata		X
palm	Palmaceae		X

EARLY MIOCENE VAQUEROS FM.

24 localities

Common Name	Taxon	locality #	Location	# of localities	Within City?	Reference
invertebrates	numerous	LACMIP 1189	Moulton Parkway; 2 miles south of intersection with El Toro Road	1	no	LACMIP 2018
		LACMIP 16392	west side of Plano Trabuco; Santa Ana Mts.; Corona Topo	1	no	LACMIP 2018
		LACMIP 16508	Hicks Canyon, El Toro 7.5'topo	1	no	LACMIP 2018
		LACMIP 7700, 16443,16667	Orange County	3	no	LACMIP 2018
		LACMIP 17601	Bee Canyon Landfill	1	no	LACMIP 2018
whale	Cetacea	SDNHM 4610	Bolero Lookout	1	possibly	SDNHM 2018
sea cow	Sirenia					
mammal	Mammalia					
sharks and rays	numerous					
turtle	Testudinidae					
invertebrates	numerous	UCMP A527	Laguna Canyon	1	no	UCMP 2018
		UCMP A538	French Hill	1	no	UCMP 2018
		UCMP 1152	Aliso Creek	1	no	UCMP 2018
		UCMP 2335	Bee Canyon		no	UCMP 2018
		UCMP 2339	Oso Creek	1	no	UCMP 2018
		UCMP A528-A529, A534-A535, A537, A543, 1151, 1157, 2330, 2344, 6128	Orange County	11	no	UCMP 2018

MIDDLE MIOCENE TOPANGA FORMATION

37 localities

Locality	Location	In City?	Reference
LACM 3222	western side of Aliso Creek	yes	McLeod 2018
LACM 4007	at the head of Rim Rock Canyon south of Temple Hill Drive	yes	McLeod 2018
LACM 4464, 4545-4552, 4556-4558, 4961, 5494-5496	Oso Dam area	no	McLeod 2018
LACM 5511	near Cook's Corner	no	McLeod 2018
LACM 5769	Oso Creek	no	McLeod 2018
LACM 6064	Mission Viejo east of Oso Creek	no	McLeod 2018
LACM 7200	south of LACM 5511	no	McLeod 2018
LACM 7249	Top of the World; on top of the ridge above Temple Hill	yes	McLeod 2018
OCPC 2003, 2007, 2036, 2044, 2045, 2051, 2079, 2094, 2097-2098, 2123, 2250	ETC Blackstar Canyon USGS 7.5' topo	no	OCPC 2018
UCMP 1056	Santiago Canyon Road	possibly	UCMP 2018
UCMP V72060	Top Of The World	yes	UCMP 2018

Common Name	Taxon	LACM 3222	LACM 4007	LACM 4464, 4545-4552, 4556-4558, 4961, 5494-5496	LACM 5511	LACM 5769	LACM 6064	LACM 7200	LACM 7249	OCPC 2003, 2007, 2036, 2044, 2045, 2051, 2079, 2094, 2097-2098, 2123, 2250	UCMP 1056	UCMP V72060
walrus-like seal	†*Allodesmus* sp.			X						X		
eared seal	†*Eotaria citrica*			X			X					
seal	Otaridae									X		
walrus	†*Neotherium* sp.			X						X		
	†*Pelagiarctos* sp.			X								
right whale	Cetotheriidae			X								
baleen whale	Mysticeti									X		
dolphin	†*Lamprolithax* sp.			X								
	Delphinidae									X		
sperm whale	Physeteridae									X		
toothed whale	Odontoceti									X		
whale	Cetacea									X		
elephant	Proboscidea									X		
dugong	†*Metaxytherium arctodites*				X							
sea cow	†*Dioplotherium allisoni*								X		X	
	†Dugongidae		X									
desmostylus	†*Desmostylus hesperus*											X
	†*Desmostylus* sp.	X		X				X				
	†*Paleoparadoxia* sp.						X					
	Desmostylia									X		
rodents	numerous									X		
duck	Anatinae			X								

Common Name	**Taxon**	LACM 3222	LACM 4007	LACM 4464, 4545-4552, 4556-4558, 4961, 5494-5496	LACM 5511	LACM 5769	LACM 6064	LACM 7200	LACM 7249	OCPC 2003, 2007, 2036, 2044, 2045, 2051, 2079, 2094, 2097-2098, 2123, 2250	UCMP 1056	UCMP V72060
auklet	†*Alcodes ulnulus*			X								
booby	Sulidae			X								
albatross	†*Diomedea milleri*			X								
shearwater	†*Puffinus priscus*			X								
leatherback sea turtle	Dermochelyidae			X								
sea turtle	Chelonioidea									X		
bony fish	numerous			X						X		
sharks and rays	numerous			X		X				X	X	
invertebrates	numerous									X		

LATE MIOCENE MONTEREY FORMATION

Monterey Formation – 31 localities

Locality	Location	In City?	Reference
LACM 3198, 3486, 3209-3210, 3412-3413, 4103-4114	southwestern portion of the proposed project area	no	McLeod 2018
OCPC 00023	Pecten Reef I	yes	OCPC 2018
OCPC 05431	Pecten Reef, Carol Stadum collection	yes	OCPC 2018
SDNHM 4520	Pecten Reef- Lake Forest	yes	SDNHM 2018
SDNHM 4522	Pecten Reef - Lake Forest - Phosphate Bed	yes	SDNHM 2018
SDNHM 4892	Pecten Reef - Lake Forest - Diatomite/Ash	yes	SDNHM 2018
SDNHM 4964	Pecten Reef- Lake Forest- Orange Sand	yes	SDNHM 2018
UCMP 1910	Aliso Creek	no	UCMP 2018
UCMP 6131	Bee Canyon	no	UCMP 2018
UCMP 36218	Antonio Parkway	yes	UCMP 2018
UCMP V71020	El Toro 1	no	UCMP 2018
UCMP V91240/ LACM 7136	Moulton Parkway	yes	UCMP 2018
UCMP V99592, V99593	Turtles	yes	UCMP 2018

Common Name	Taxon	LACM 3198, 3486, 3209-3210, 3412-3413, 4103-4114	OCPC 00023, 5431	SDNHM 4520, 4522, 4892, 4964	UCMP 1910, 6131, 36218	UCMP V71020	UCMP V91240/ LACM 7136	UCMP V99592, V99593
walrus-like seal	†*Allodesmus kernensis*					X		
walrus-like seal	†Desmatophocidae?			X				
sea lion	Otariidae	X				X		
dolphin	†Kentriodontidae	X						
sperm whale	Physeteridae					X		
toothed whale	Odontoceti			X				
rorqual whale	Balaenopteridae?			X				
baleen whale	Mysticeti	X						
whale	Cetacea			X				
dugong	†*Dioplotherium allisoni*	X						
	Dusisiren jordani					X		
desmostylus	†Desmostylidae			X				
bird	Aves	X					X	
crocodile	†*Crocodylus* sp.	X						
	†Crocodylidae			X				
leatherback sea turtle	†*Psephophorus* sp.						X	
leatherback sea turtle	Dermochelyidae							X
sea turtle	Cheloniidae			X				
bony fish	numerous	X		X		X	X	
sharks and rays	numerous	X	X	X		X	X	
invertebrates	numerous	X	X	X	X			
land plants	numerous			X				
algae	numerous			X				

LATE MIOCENE PUENTE FORMATION

35 localities

Common Name	Taxon	Puente Formation Member	locality #	Location	# of localities	Within City?	Reference
sea lion	Otariidae	La Vida	OCPC 2041-2043, 2046 2050, 2053, 2056, 2058, 2110, 2124, 2130-2131, 2155, 2177, 2191, 2193, 2211, 2235-2244, 2246-2248, 2254-2256, 2261-2262	ETC Blackstar Canyon USGS 7.5' topo	35	no	OCPC 2018
desmostylus	†*Desmostylus* sp.						
	†Desmostylidae						
bony fish	numerous						
sharks and rays	numerous						
invertebrates	numerous						
land plants	numerous						
herring	Clupeoidei	Soquel	OCPC 2245	ETC Blackstar Canyon USGS 7.5' topo	1	no	OCPC 2018
tonguefish	*Symphurus* sp.	undifferentiated	LACM 6287	southeast of Santiago Reservoir along Santiago Cyn Rd in Limestone Cyn	1	no	McLeod 2018
bony fish	Osteichthyes	undifferentiated	UCMP V68103	Aliso Creek	1	no	UCMP 2018

LATE MIOCENE TO PLIOCENE CAPISTRANO AND PLIOCENE NIGUEL FORMATIONS

Capistrano Formation, Oso Sand – 33 localities

Locality	Location	In City?	Reference
OCPC 00013	El Toro Materials Co. Rocky Rd	yes	OCPC 2018
OCPC 00131	El Toro Rd Island	yes	OCPC 2018
OCPC 00429, 00559	Orange County	no	OCPC 2018
OCPC 00721	Waldo locality, JMTC-828	yes	OCPC 2018
OCPC 01000	Aliso Creek Flying Whale	yes	OCPC 2018
OCPC 03203	JMTC-F-8		OCPC 2018
OCPC 03204- 03223	JMTC-808 to JMTC-827		OCPC 2018
OCPC 03224	JMTC-829		OCPC 2018
OCPC 04129	Baker Ranch, MM93-511-1	yes	OCPC 2018
OCPC 05337	El Toro Materials, ELT230, BRS-030523-0	yes	OCPC 2018
OCPC 05340	El Toro Materials, ELT230, BRS-030905-01	yes	OCPC 2018
OCPC 05341	El Toro Materials, ELT230, BRS-041103-01	yes	OCPC 2018
OCPC 05342	El Toro Materials, ELT230, KSB-030509-01	yes	OCPC 2018
OCPC 05344	El Toro Materials, ELT230, BRS-040520-01	yes	OCPC 2018
OCPC 05345	El Toro Materials, ELT230, LSA-ETM-General	yes	OCPC 2018
OCPC 05346	El Toro Materials, ELT230, BRS-021127-01	yes	OCPC 2018
OCPC 05348	El Toro Materials, ELT230, BRS-040106-01	yes	OCPC 2018
OCPC 05349	El Toro Materials, ELT230, BRS-040114-01	yes	OCPC 2018
OCPC 05350	El Toro Materials, ELT230, SKY-030325-01	yes	OCPC 2018
SDNHM 6316 - 6320	AJ West Ranch	yes	SDNHM 2018

Capistrano Formation – 30 localities

Locality	Location	In City?	Reference
LACM 3199, 3218, 3221, 3410-3411, 3491, 4177, 4666-4668, 5500, 7370-7372, 7546-7547	Lake Forest	yes	McLeod 2018
UCMP IP7081	Doheny State Park	no	UCMP 2018
UCMP V5049	Petrel		UCMP 2018
UCMP V72103	El Toro 2	yes	UCMP 2018
UCMP V72149	Sulpher Creek Reservoir		UCMP 2018

Niguel Formation – 4 localities

Locality	Location	In City?	Reference
LACM 3804	south of Oso Parkway ~1/2 mi west of I-5	yes	McLeod 2018
LACM 5551	south along La Paz Road west of I-5	yes	McLeod 2018
LACM 7058	almost due east of the southeastern-most point of the proposed project area east of I-5 and north of La Paz Rd in Mission Viejo	yes	McLeod 2018
LACM 65187	north of La Paz Road west of I-5	yes	McLeod 2018

Common Name	Taxon	Niguel Fm.	Capistrano Fm., Oso Sand	Capistrano Fm.
giant otter	†*Satherium* sp.			X
walrus-like seal	†*Allodesmus* sp.		X	
false walrus	†*Gomphotaria pugnax*		X	X
false walrus	†*Gomphotaria* sp.		X	
walrus	†*Pliopedia* sp., Odobenidae		X	
sea lion	†*Imagotaria* sp.			X
sea lion	†Imagotariinae		X	
sea lion	Otariinae, Otariidae		X	
fur seal	*Arctocephalus* sp.		X	
true seal	Phocidae		X	
pinneped	Pinnipedia		X	
carnivore	Carnivora		X	
rodent	Rodentia		X	
antilocaprid	Antilocapridae		X	
camels	†*Camelops* sp., †*Megatylopus* sp.		X	
camel	†Camelidae	X	X	X
artiodactyl	Artiodactyla		X	
right whale	Balaenidae		X	X
rorqual whale	Balaenopteridae		X	X
primitive baleen whale	†*Herpetocetus* sp.	X		X
baleen whales	Cetotheriidae, Mysticeti		X	
dolphin	†*Piscolithax* sp., Delphinidae		X	
sperm whale	*Physeter microcephalus*		X	
sperm whale	Physeteridae			X
toothed whale	Odontoceti		X	
whale	Cetacea	X	X	X
horses	†*Pliohippus* sp.		X	X
horses	†cf. *Dinohippus* sp., †Equidae		X	
rhinoceros	†Rhinocerotidae		X	X
mastodon	†Mammutidae		X	
dugong	Dungonidae	X	X	X
sea cow	Sirenia		X	
desmostylus	†*Desmostylus* sp., †Desmostylidae		X	
storm petral	†*Oceanodroma hubbsi*			X
toothed-bird	†*Osteodontornis* sp.		X	
sandpiper	Scolopacidae			X
puffin	Mancallinae			X
bird	Aves		X	
leatherback sea turtle	†*Psephophorus* sp.			X
leatherback sea turtle	Dermochelyidae		X	
sea turtle	Chelonioidea		X	

Common Name	**Taxon**	**Niguel Fm.**	**Capistrano Fm., Oso Sand**	**Capistrano Fm.**
tortoise	†*Geochelone* sp.			X
tortoise	*Testudo* sp.		X	
crocodile	Crocodylidae			X
bony fish	numerous	X	X	X
sharks and rays	numerous		X	X
invertebrates	numerous		X	X
land plants and algae	numerous		X	

PLEISTOCENE LOCALITIES
29 localities

Locality	Location	In City?	Reference
LACM 65129	Costeau Pit	no	McLeod 2018
LACM 69121	Bolsa Chica State Park	no	Jefferson 1991
OCPC 2005, 2006, 2033, 2048, 2049, 2054, 2055, 2070-2072, 2093, 2120, 2129, 2210, 2232, 2233	Black Star Canyon 7.5', Hwy 241	no	OCPC 2018
OCPC 2002, 2004, 2029, 2086, 2121, 2229-2231	El Toro 7.5', Hwy 133	no	OCPC 2018
OCPC 2000, 2001, 2258	Tustin 7.5', Hwy 133	no	OCPC 2018

Common Name	Taxon	other localities	Costeau Pit, Laguna Hills
Harlan's ground sloth	†*Paramylodon harlani*	X	X
Jefferson's ground sloth	†*Megalonyx jeffersoni*	X	
ground sloth	†cf. *Megalonyx* sp.	X	
coyote	*Canis* sp. cf. *C. latrans*		X
dire wolf	†*Canis* sp. cf. *C. dirus*		X
short faced bear	†*Ursus arctodus*	X	
saber-toothed cat	†*Smilodon* sp. cf. *S. fatalis*		X
American lion	†*Felis atrox*	X	
Columbian mammoth	†*Mammuthus columbi*		X
mammoth	†*Mammuthus* sp.	X	
American mastodon	†*Mammut* sp. cf. *M. americanum*	X	
mammoth or mastodon	†Proboscidea	X	
horses	†*Equus occidentalis*	X	
horses	†*Equus* sp.	X	X
yesterday's camel	†*Camelops* sp. cf. *C. hesternus*		X
llama	†*Hemiauchenia* sp.		X
diminutive pronghorn	†*Capromeryx* sp.		X
deer	Cervidae		X
ancient bison	†*Bison antiquus*	X	X
long-horned bison	†*Bison latifrons*		X
desert shrew	*Notiosorex crawfordi*		X
shrew	*Sorex* sp.	X	
brush rabbit	*Sylvilagus* sp. cf. *S. bachmani*		X
desert cottontail	*Sylvilagus audubonii*		X
black-tailed jack rabbit	*Lepus* sp. cf. *L. californicus*		X
California ground squirrel	*Spermophilus beecheyi*		X
Botta's pocket gopher	*Thomomys bottae*		X
kangaroo rat	*Dipodomys* sp.		X
California pocket mouse	*Perognathus* sp. cf. *P. californicus*		X
eastern harvest mouse	*Reithrodontomys* sp. cf. *R. humulis*		X
deer mouse	*Peromyscus maniculatus*		X
wood rat	*Neotoma* sp.		X

Common Name	**Taxon**	**other localities**	**Costeau Pit, Laguna Hills**
vole	*Microtus* sp.		X
muskrat	*Ondatra* sp.		X
long-tailed weasel	*Mustela frenata*		X
duck	*Anas* sp.		X
hawk	*Buteogallus* sp.		X
quail	*Callipepla* sp.		X
American coot	*Fulica* sp. cf. *F. americana*		X
owl	*Athene* sp.		X
passerine bird	Passeriformes		X
fence lizard	*Sceloporus* sp.		X
whip-tailed lizard	*Cnemidophorus* sp.		X
Mojave green rattlesnake	*Crotalus viridis*		X
rattlesnake	*Crotalus* sp.	X	
pine snake	*Pituophis melanoleucus*		X
gopher snake	*Pituophis* sp.	X	
lizard or snake	Squamata		X
western pond turtle	cf. *Actinemys marmorata*		X
desert tortoise	*Gopherus* sp.		X
western toad	*Anaxyrus boreas*		X
northern red-legged frog	*Rana aurora*		X
arboreal salamander	*Anedes lugubris*		X
mole salamander	*Ambystoma* sp.	X	
frog	Anura	X	

APPENDIX D. CULTURAL RESOURCE STUDIES

Report No.	Author(s)	Title	Year	Quad Maps
OR-00019	Howard, Jerry B.	Archaeological Site Survey, El Toro Road Realignment	1975	El Toro
OR-00052	Van Horn, David M.	Archaeological Survey Report on the Site of the Proposed El Toro Community Park in the Unincorporated Territory of El Toro	1977	El Toro, San Juan Capistrano
OR-00064	Desautels, Roger J.	Archaeological Survey Report on Tentative Tract No. 9037 Lot G in Block a of County of Orange	1976	El Toro
OR-00069	Desautels, Roger J.	Archaeological Survey Report on the Planning Area, Lake Forest 1, Orange County, California	1976	El Toro
OR-00070	Desautels, Roger J.	Archaeological Survey Report on the Proposed Park Lane Mobile Estates Located in the El Toro Area, Orange County, California	1976	San Juan Capistrano
OR-00074	Desautels, Roger J.	Archaeological Survey Report on the Northwesterly Boundary of Tentative Tract No. 8461 in the El Toro Area of Orange County, California	1976	El Toro
OR-00078	Desautels, Roger J.	Area 16-13 Located at 25114 Irvine Blvd. in the Lake Forest Area of Orange County, California	1976	El Toro
OR-00088	Desautels, Roger J.	Archaeological Survey Report on Lot D and a Portion of Lot C of the Baldwin and Bridgers Subdivision Located in the El Toro Area of Orange County	1976	San Juan Capistrano
OR-00101	Desautels, Roger J.	Archaeological Survey Report on Tract No. 9106 Located in the Lake Forest Area of Orange County	1976	El Toro
OR-00135	Whitney-Desautels, Nancy A.	Archaeological Survey Report on Approximately a Twenty-one (21) Acre Parcel Located in the El Toro Area of the County of Orange	1977	El Toro
OR-00148	Desautels, Roger J.	Archaeological Survey Report on 17.63 Acres of Land Located in the Rancho De Los Alisos Area of the County of Orange	1977	El Toro
OR-00171	Desautels, Roger J.	Archaeological Survey Report on Lot 5, Tract 70 in the Aliso City Area of the County of Orange	1987	El Toro
OR-00180	Desautels, Roger J.	Archaeological Survey Report on a Parcel of Land Located in the Cook's Corner Area of the County of Orange	1977	Santiago Peak
OR-00185	Desautels, Roger J.	Archaeological Survey Report on a 34 Acre Parcel of Land Located in the El Toro Area of the County of Orange	1977	El Toro
OR-00189	Desautels, Roger J.	Archaeological Survey Report on a Fifty (+) Acre Parcel of Land in the El Toro Area of the County of Orange	1977	El Toro
OR-00201	Perry, Robert	Archaeological Survey Report on an Archaeological Survey of a Fifty (50) Acre Parcel of Land Located in the El Toro Area of the County of Orange	1977	El Toro
OR-00208	La Fontaine, Keith	Archaeological Survey Report on Seventy-seven (77) Acres of Land Located in the El Toro Area of the County of Orange	1978	El Toro
OR-00209	La Fontaine, Keith and Mark Desautels	Archaeological Survey Report on 7.42 Acres of Land Located in the El Toro Area of the County of Orange	1978	El Toro
OR-00238	Howard, Jerry B.	A Reevaluation of the Cultural Resources of the Glen Ranch	1977	El Toro, Santiago Peak
OR-00251	Desautels, Roger J. and Paul G. Chace	Archaeological Report on an Archaeological Survey, Inventory, and Analysis of Alternate Realignment of El Toro Road Between 2.6 Miles Northerly of Trabuco Road and Live Oak Canyon Road in Orange County, California	1976	El Toro, Santiago Peak

Report No.	Author(s)	Title	Year	Quad Maps
OR-00254	Whitney-Desautels, Nancy A.	Archaeological Report on the Aliso Creek Specific Plan-planning Unit 1 Located in the El Toro and Laguna Hills Area of the County of Orange	1977	El Toro, San Juan Capistrano
OR-00277	Cottrell, Marie G.	Archaeological Reconnaissance of the Serrano Highlands, Project Area (rancho De Los Alisos, Units 1 & 2)	1978	El Toro
OR-00286	Bean, Lowell	Cultural Resources and the High Voltage Transmission Line From San Onofre to Santiago Substation and Black Star Canyon	1979	,El Toro, San Juan Capistrano
OR-00322	Mabry, Theo N.	Archaeological Records Search and Reconnaissance Survey for Tentative Tract 10633, Orange County, California	1979	El Toro, San Juan Capistrano
OR-00327	Whitney-Desautels, Nancy A.	The Archaeology and History of Heritage Hill: a Proposed Historical Complex of Serrano Community Park	1978	El Toro
OR-00387	Unknown	Archaeological Survey Report on a 120 Acre Parcel of Land Located Along Santiago Canyon Rd. 2 Miles North of Cook's Corner	1977	El Toro
OR-00398	Kearns, Timothy M. and Nancy Whitney-Desautels	Archaeological Report on Archaeological Sites CA-ORA-693, ORA-694, ORA-695, ORA-696, ORA-697, and ORA-699 Located on Rancho De Los Alisos in the County of Orange	1978	El Toro
OR-00404	Wright, Thomas	Archaeological Investigations at CA-ORA-566	1976	El Toro
OR-00444	McCawley, William	Letter Report: Archaeological Survey of a 20 Acre Parcel in the County of Orange (t.r. 10633)	1979	El Toro, San Juan Capistrano
OR-00457	Clevenger, Joyce M.	Archaeological Investigations on Portions of CA-ORA-647 and Ca ORA-648: Two Sites Located Within the Santiago Aqueduct Parallel Project	1979	El Toro
OR-00465	Desautels, Roger J.	Archaeological Survey Report on Tt 10789, Located in the Rancho Serrano Area of the County of Orange	1979	El Toro
OR-00471	Whitney-Desautels, Nancy A.	Cultural Resources Report on Site Plan Number 79-26 Located in the Lake Forest Area of the County of Orange	1980	El Toro
OR-00495	Cottrell, Marie G.	Archaeological Assessment of Rancho De Los Alisos Planning Area 6.	1980	El Toro
OR-00545	Munoz, Jeanne and Theodore G. Cooley	Glenn Ranch: Archaeological Resources and Their Recommended Management	1977	El Toro, Santiago Peak
OR-00546	Cottrell, Marie G.	Records Search for 19+ Acres of the Glen Ranch	1978	El Toro
OR-00560	Cottrell, Marie G.	Letter Report to Mr. Richard Schmid, Envista Inc.	1977	El Toro
OR-00571	Ahlering, Michael L.	Report of Findings of a Scientific Resources Survey and Study: Conducted on a Portion of the Whiting Ranch, Orange County, California	1973	El Toro
OR-00580	Anonymous	The Aliso Creek Watershed, Orange County, California a Proposal for Creating an Archaeological District for the National Register of Historic Places and a Suggested Research and Study Design	1977	El Toro, ,San Juan Capistrano, Santiago Peak

Report No.	Author(s)	Title	Year	Quad Maps
OR-00581	McCoy, Lesley C. and Kirkish, Alex N.	Cultural Resources Data Recovery Program for the 230kv Transmission Line Rights-of-way From San Onofre Nuclear Generating Station to Black Star Canyon and Santiago Substation and to Encina and Mission Valley Substations	1982	El Toro, San Juan Capistrano,
OR-00591	Cooley, Theodore G. and Marie G. Cottrell	Archaeological Assessment of the Whiting Ranch	1980	El Toro
OR-00611	Bissell, Ronald M.	Cultural Resources Reconnaissance of the Baker Ranch Property, El Toro Orange County,	1988	El Toro
OR-00613	Whitney-Desautels, Nancy A.	Archaeological Report on a Micro-surface Collection of CA-ORA-741 Located on Tt 10323 in the El Toro Area of the County of Orange	1981	El Toro
OR-00627	Jertberg, Patricia R.	An Archaeological Test and Salvage Investigation of CA-ORA-39 and CA-ORA-773, Orange County, California	1981	El Toro
OR-00629	Cottrell, Marie G.	Archaeological Resource Assessment for Two Parcels Near El Toro, California	1981	El Toro
OR-00648	Breece, Bill and Beth Padon	Cultural Resource Survey: Archaeological Resources: Foothill Transportation Corridor, Phase Ii	1982	El Toro, Santiago Peak,
OR-00656	Bissell, Ronald M.	Cultural Resources Survey, Country Home Road Properties (shefflette/carisoza/buckley, Lyon, Watson and 4s Ranch Parcels, Santiago and Live Oak Canyon Roads, Orange County, California	1983	El Toro, Santiago Peak
OR-00730	Bissell, Ronald M.	Cultural Resources Assessment Tentative Tract 12110 Orange County, California	1984	El Toro
OR-00738	Bissell, Ronald M.	Cultural Resources Assessment Tentative Tract 11986 Orange County, California	1984	El Toro
OR-00748	Bissell, Ronald M.	Cultural Resources Assessment Los Alisos Research and Development Park El Toro, Orange County, California	1984	El Toro
OR-00766	Bissell, Ronald M.	Archaeological Survey of the Peterson Property, Four Acres in Santiago Canyon, Orange County, California	1985	El Toro
OR-00773	Bissell, Ronald M.	Archaeological Site CA-ORA-1057, a Late Prehistoric Period Hunting Camp in El Toro, Orange County, California	1985	El Toro
OR-00791	Bissell, Ronald M.	Archaeological Sites CA-ORA-1058 and CA-ORA-698: a Milling Stone Period Complex in El Toro	1985	El Toro
OR-00798	Bissell, Ronald M.	Archaeological Survey of the Canada Apartments Property in El Toro, Orange County, California	1985	El Toro
OR-00799	Bissell, Ronald M.	Archaeological Survey of Property Belonging to the William Lyon Company El Toro, Orange County, California	1985	El Toro
OR-00819	McKenna, Jeanette A.	Final Report on Archaeological Investigations at Sites CA-ORA-858, 859, and 698, Rancho De Los Alisos, Orange County, California	1986	El Toro
OR-00851	Bissell, Ronald M.	Archaeological Sites CA-ORA-176 and CA-ORA-1100 in the El Toro Area, Orange County, California	1986	El Toro
OR-00868	Padon, Beth	Historic Property Survey Report for the I-5/I-405 Confluence City of Irvine, Ca	1987	El Toro, San Juan Capistrano
OR-00875	Bissell, Ronald M.	Cultural Resources Reconnaissance of the Canada Ridge Lane Property, El Toro, Orange County, California	1987	El Toro

Report No.	Author(s)	Title	Year	Quad Maps
OR-00899	Anonymous	Draft Environmental Impact Report No. 481 Foothill Ranch (formerly Whiting Ranch) Planned Community Area Plan, General Plan Amendment and Zone Change	1987	El Toro
OR-00909	Bissell, Ronald M.	Cultural Resources Reconnaissance of Tentative Parcel 83-110, El Toro, Orange County	1988	El Toro
OR-00934	Drover, Christopher E. and Henry C. Koerper	Archaeological Test Investigations: the Phase I Development of the Whiting Ranch	1982	El Toro
OR-00940	Bissell, Ronald M.	Interim Report Test Excavation of Nine Archaeological Sites on the Pacific Commercentre Property, El Toro Area, Orange County California	1988	El Toro
OR-00970	Brock, James P.	Report on Archaeological Monitoring of Rough Grading for the Baker Extension of Lake Forest Drive, El Toro, California	1989	El Toro
OR-01011	Sorensen, Jerrell H.	Archival Research for Interstate 5, From the Confluence With I 405 to Route 1, Capistrano	1990	El Toro, San Juan Capistrano
OR-01026	Mason, Roger D.	Cultural Resources Survey Report Santiago Canyon Road Alignment Study Orange County, California	1990	El Toro, Santiago Peak
OR-01036	Anonymous	Archaeological Resource Survey Valley Vista Development Orange County, California	1989	Santiago Peak
OR-01038	Brock, James P.	Report on Archaeological Monitoring of Rough Grading for Sta. 55+20.64 to Sta. 70+00.00 of Portola Parkway, El Toro, California	1990	El Toro
OR-01067	Brown, Joan C.	Cultural Resources Reconnaissance of the 72 Acre El Toro Industrial Park	1991	El Toro
OR-01088	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Bake Parkway From Portola Parkway to Station 159+40.81, El Toro, California	1990	El Toro
OR-01099	Cooley, Theodore G.	Archaeological Resources Assessment Conducted for Proposed Irvine Ranch Water District Pipeline Right of Ways	1979	El Toro
OR-01108	Padon, Beth	Archaeological and Paleontological Resource Assessment, Laguna Canyon Reclaimed Water Facilities	1991	El Toro
OR-01137	Demcak, Carol R.	Cultural Resource Assessment for Planning Areas 11, 17, 27, 67, 80, and 81, Mission Viejo.	1991	El Toro, San Juan Capistrano, Santiago Peak
OR-01150	Perry, Robert	Archaeological Survey Report on Approximately 200 Acres of Rancho De Los Alisos Located in the El Toro Area, County of Orange	1977	El Toro
OR-01152	Sire, Joan, Edward Johnstone, and Doren Desautels	Archaeological Test Report on the Archaeological Resources Contained on a 279+ Acre Parcel of Land Located in the Canada De Los Alisos Area of the County of Orange	1978	El Toro
OR-01156	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Portola Parkway at Aliso Creek, El Toro, California (station 13+67 to El Toro Road)	1991	El Toro

Report No.	Author(s)	Title	Year	Quad Maps
OR-01157	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Portola Parkway From Station 13+67 to Station 42+24, El Toro, California	1991	El Toro
OR-01158	Brock, James P.	Report on Part-time Archaeological Monitoring of Rough Grading of Portola Parkway From Station 42+24 to Station 55+02, Foothill Ranch, El Toro, California	1991	El Toro
OR-01163	Macko, Michael E.	Letter Report on the Results of an Archaeological Survey for the Proposed Botanical Study Area, Wilderness Glen, City of Mission Viejo	1991	El Toro
OR-01309	Macko, Michael E.	Final Report Summary of Archaeological Monitoring, Test Excavations, and Data Recovery for the Foothill Transportation Corridor Northern Segment	1993	El Toro, Santiago Peak
OR-01310	Macko, Michael E. and Gary Hurd	Results of Archaeological Test Excavations for the Foothill Transportation Corridor Northern Segment, Construction Section F8 and F9	1992	El Toro
OR-01354	Munoz, Jeanne	History and Historical Resources of the Whiting Ranch	1980	El Toro
OR-01364	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Planning Area 6, Foothill Ranch, El Toro, California	1993	El Toro
OR-01372	Brown, Joan C.	Mitigation and Monitoring of Eight Prehistoric Archaeological Sites, CA-ORA-510, CA-ORA-647, CA-ORA-648, CA-ORA-1062, CA-ORA-1063, CA-ORA-1065, CA-ORA-1066, CA-ORA-1171, Located in Southern Orange County, California	1994	El Toro
OR-01376	Brock, James P.	Archaeology of Foothill Ranch Planning Area 15 and a Portion of Planning Area 16, El Toro, California	1994	El Toro
OR-01378	Becker, Kenneth M.	Cultural Resources Reconnaissance of the Proposed Irvine Ranch Water District Zone 9 Reservoir and Transmission Main, Orange County, California.	1994	El Toro
OR-01407	Brown, Joan C.	Cultural Reconnaissance for the Service Connection Enlargement of the Flow Control Facility St-04	1994	El Toro
OR-01408	Demcak, Carol R.	Final Report of Test Level Investigation at ORA-758, Alton Parkway Extension Project, County of Orange, California	1994	El Toro
OR-01425	Brock, James P.	Report on Archaeological Monitoring of the Glenn Ranch Road Right-of-way, Foothill Ranch, El Toro, Orange County, California	1995	El Toro
OR-01432	Harris, Nina M. and James Brock	Test Investigations at CA-ORA-827 and CA-ORA-1373, Glenn Ranch Road Right-of-way, Foothill Ranch, El Toro, Orange County, California	1994	El Toro
OR-01439	McCoy, Lesley C. and Phillips Roxana	National Register Assessment Program of Cultural Resources of the 230 Kv Transmission Line Rights-of-way From San Onofre Nuclear Generating Station to Black Star Canyon and Santiago Substation and to Encina and Mission Valley Substation	1980	El Toro, San Juan Capistrano,
OR-01445	Desautels, Roger J., David Van Horn, Paul Chase, and Nancy Whitney	Archaeological Field Test Report on Archaeological Sites Ora458, Ora485, Ora486, Ora488 & Ora507 Located in the Upper Aliso Creek Area of Orange County P.O. No. C 60012 Control No.39717	1977	El Toro, Santiago Peak
OR-01495	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Planning Area 8, Foothill Ranch, El Toro, California	1996	El Toro

Report No.	Author(s)	Title	Year	Quad Maps
OR-01536	Brown, Joan C.	Archaeological Reconnaissance for the Whiting Zone 9 Reservoir and Transmission Main, Orange County, California	1995	El Toro
OR-01545	Brown, Joan C.	Archaeological Monitoring of a Portion of the Whiting Zone 9 Reservoir and Transmission Main, Orange County	1997	El Toro
OR-01549	Brock, James P.	Cultural Resources Assessment of an Approximately 11-acre Property in Lake Forest California	1997	El Toro
OR-01551	Brock, James P.	Report on Archaeological Monitoring of a Rough Grading of Planning Area 9, Foothill Ranch, El Toro California	1997	El Toro
OR-01563	Brock, James P.	Report on Archaeological Monitoring of Planning Area 12, Foothill Ranch, El Toro, Orange County, California	1997	El Toro
OR-01567	Jertberg, Patricia R.	Archaeological Services for 25781 Atlantic Ocean Drive, Lake Forest (permit #w007506)	1997	El Toro
OR-01583	Nicoll, Gerald A.	Archaeology and Paleontology Report for Rancho De Los Alisos Area, Orange County, California	1974	El Toro
OR-01637	Sawyer, William A. and Brock, James	Report on Archaeological Monitoring for the Aliso Oaks Ranch Project (tentative Tract 11919), Santiago Canyon, Orange County, California	1998	Santiago Peak
OR-01679	Jertberg, Patricia R.	Archaeological Services for Tract 13343, Lot 5, Pacific Commercentre, Lake Forest	1998	El Toro
OR-01687	Brock, James P.	Report on Archaeological Monitoring of Rough Grading of Planning Area 16, Tentative Tract 13419, Foothill Ranch, El Toro, California	1998	El Toro
OR-01696	Jertberg, Patricia R.	Archaeological Services for Tract 13344, Lot 13, 26012 Atlantic Ocean Drive, and Lot 39, 26021 Commercentre Drive, Lake Forest	1998	El Toro
OR-01697	Jertberg, Patricia R.	Archaeological Services for Tract 13343, Lot 1, 20571 Crescent Bay Drive, Lake Forest	1998	El Toro
OR-01698	McLean, Deborah K.	Archaeological Assessment for Pacific Bell Mobile Services Telecommunications Facility Cm 310-04, 1505-3533 East Chapman Avenue, City of Orange, County of Orange, California	1998	Orange
OR-01749	Brechbiel, Brant A.	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: Cm 225-22 in the City of Lake Forest, California	1998	El Toro
OR-01750	Brechbiel, Brant A.	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: Cm 243-39 in the City of Lake Forest, California	1998	El Toro
OR-01752	Brechbiel, Brant A.	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: Cm 410-11 in the City of Lake Forest, California	1998	El Toro
OR-01996	Brown, Joan C.	Cultural Resources Literature and Records Review for the Foothill/Trabuco Project (Revised)	1999	El Toro, Santiago Peak
OR-02039	Duke, Curt	Cultural Resource Assessment for Pacific Bell Mobile Services Facility Cm 285-04, County of Orange, California	1999	San Juan Capistrano
OR-02100	Duke, Curt	Cultural Resource Assessment for Pacific Bell Wireless Facility Cm 367-01, County of Orange	2000	El Toro
OR-02110	Duke, Curt and Nicole Wallock	Results of the Cultural Resource Records Search and Extended Survey for Pacific Bell Wireless Facility Cm 324-03, Orange County	2000	El Toro
OR-02111	Brock, James P.	Cultural Resources Assessment of a 13.2 Acre Property in Lake Forest	2000	El Toro

Report No.	Author(s)	Title	Year	Quad Maps
OR-02112	Brock, James P.	Cultural Resources Evaluation for the Foothill Gateway Project, City of Lake Forest, Orange County	2000	El Toro
OR-02211	Hoover, Anne M.	Cultural Resources Reconnaissance and Monitoring of Pacific Commercentre, and Mitigation of CA-ORA-1581, City of Lake Forest, County of Orange, Ca	2001	El Toro
OR-02218	Brock, James P.	Archaeological Assessment for the Proposed Comfort Inn Project, 20768 Lake Forest Drive, Orange County, Ca	2000	El Toro
OR-02219	White, Robert S., White, Laurie, and Minch, John	Archaeological and Paleontological Assessments of a 12.05 Acre Parcel Located Just East of Dimension Drive and Enterprise Way in Lake Forest, Orange County	2000	El Toro
OR-02334	Hoover, Anna M.	Archaeological and Paleontological Monitoring at Lots 9 and 10, Tract 15753, Lake Forest , Orange County, California	2001	El Toro
OR-02420	Duke, Curt	Cultural Resource Assessment Cingular Wireless Facility No. Sc 059-02 Orange County, California	2002	San Juan Capistrano
OR-02522	Wallock, Nicole	Upper Aliso Creek Archaeological District	2001	El Toro, Santiago Peak
OR-02531	Duke, Curt	Cultural Resource Assessment AT&T Wireless Services Facility No. 13113a, Orange County, California	2002	El Toro
OR-02569	Henriksen, Karen J.	Final Archaeological Report on Archaeological Sites CA-ORA-693, CA-ORA-694, CA-ORA-695, CA-ORA-696, CA-ORA-697, and CA-ORA-699 Located on Rancho De Los Alisos in the County of Orange	1983	El Toro
OR-02575	Colegrove, Stephen E.	Archaeological and Paleontological Site Survey of Planning Areas 70, 41, and 3, Mission Viejo	1975	El Toro, San Juan Capistrano
OR-02646	Duke, Curt	Cultural Resource Assessment at & T Wireless Services Facility No. 13339a Orange County, California	2002	El Toro
OR-02655	Duke, Curt	Cultural Resource Assessment for Pacific Bell Wireless Facility Cm 367-01, in the County of Orange, California	2000	El Toro
OR-02660	Duke, Curt	Cultural Resource Assessment at & T Wireless Services Facility No. 13110b Orange County, California	2002	El Toro
OR-02927	Padon, Beth	Archaeological and Paleontological Monitoring of Ascension Cemetery, Phase I Improvements, in the City of Lake Forest, California	2005	El Toro
OR-02928	Demcak, Carol R.	Final Report of Salvage Level Investigations at ORA-758, Alton Parkway Extension Project, County of Orange, California	1994	El Toro
OR-02930	Bonner, Wayne H.	Records Search Results and Site Visit for Cingular Telecommunications Facility Candidate Sc-141-01 (sub Abd Sail Club), 24752 Toledo Lane, Lake Forest, Orange County, California	2003	El Toro
OR-02932	Fulton, Phil	Cultural Resource Assessment Verizon Wireless Services Julio Facility Lake Forest, Orange County, California	2005	El Toro
OR-02951	Bonner, Wayne H.	Records Search Results for Cingular Wireless Site Sc-096-04 (el Toro Memorial Park), 25741 Trabuco Rd., Lake Forest, Orange County, California	2002	El Toro
OR-02954	Wlodarski, Robert J.	Records Search Results for the Proposed Mountain Union Telecom Regency Lane Cell Site (po/ref# Sfc4001), Located at 20595 Regency Lane, City of Lake Forest, County of Orange, California	2004	El Toro

Report No.	Author(s)	Title	Year	Quad Maps
OR-03049	Bonner, Wayne H.	Cultural Resources Records Search Results and Site Visit for T-Mobile Candidate La02894a (cm367 Regency Lane), Lake Forest, Orange County, California	2006	El Toro
OR-03050	Bonner, Wayne H.	Cultural Resources Records Search Results and Site Visit for Cingular Wireless Candidate Oc-0056-01 (sce Tower/Trabuco Canyon) Santiago Canyon Road, Portola Hills, Orange County, California	2005	El Toro
OR-03063	Bonner, Wayne H.	Records Search Results for Sprint Pcs Facility Og65xc417d (the Pacific World Site), Located at 25791 Commercentre Drive, El Toro in Orange County, California	2001	El Toro
OR-03127	Smith, Brooks R. and Deborah K.B. McLean	Archaeological Monitoring Report the Orchard at Saddleback-phase Ii City of Lake Forest, Orange County, California	2006	San Juan Capistrano
OR-03148	Kyle, Carolyn E.	Cultural Resource Assessment for Cingular Wireless Facility Sc059-04 City of Laguna Hills, Orange County, California	2002	San Juan Capistrano
OR-03278	McLean, Deborah K. and Shannon, Carmack	Archaeological Monitoring Report the Orchard at Saddleback City of Lake Forest, Orange County, California	2005	San Juan Capistrano
OR-03285	Fulton, Terri and Deborah McLean	Archaeological Mitigation Monitoring Report for the Irvine Desalter Pipelines Project	2006	El Toro, Tustin
OR-03370	Greene, Richard and Brian F. Smith	A Cultural Resources Study of the Portola Center Project	2007	El Toro
OR-03373	Arrington, Cindy and Nancy Sikes	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project State of California: Volumes I and Ii	2006	El Toro, San Juan Capistrano, Santiago Peak
OR-03385	Fulton, Terri	Cultural Resource Assessment: Verizon Wireless Portola Hills Fast Track Facility Project No. 25005-005032.03 City of Lake Forest, Orange County, California	2006	El Toro
OR-03433	Bonner, Wayne H.	Cultural Resource Records Search and Site Visit Results for Sprint Nextel Candidate Ca7093 (intense), 25751 Trabuco Road, Lake Forest, Orange County, California	2007	El Toro
OR-03600	Garcia, Kyle H. and Marcy Rockman	Results of Archaeological Survey and Monitoring for Southern California Edison's Pole Replacements After Santiago Fire Along Santiago Canyon Road, Modjeska Canyon Road, and Hicks Canyon Road; Orange County, California; Jo:6259-0468	2007	El Toro, Santiago Peak
OR-03747	Bai "Tom" Tang and Michael Hogan	Identification and Evaluation of Historic Properties- Lake Forest ADA Wheelchair Access Ramp Improvement Project	2008	El Toro
OR-03748	Patrick O. Maxon	Phase II Archaeological Evaluation CA-ORA-1004 & CA-ORA-1150	2009	El Toro

Report No.	Author(s)	Title	Year	Quad Maps
OR-03749	Patrick O. Maxon	Phase I Cultural Resources Reconnaissance Survey- Proposed Alton Parkway Extension Project, Including Baker Ranch, Lake Forest, CA	2008	El Toro
OR-03757	Bai "Ton" Tang and Michael Hogan	Identification and Evaluation of Historic Properties: Lake Forest ADA Wheelchair Access Ramp Improvement Project (Phase III)	2009	El Toro, San Juan Capistrano
OR-03770	Clark, Fatima	Results of the Cultural Resource Assessment for the Southern California Edison Replacement of Deteriorated Pole Nos. 2140160E, 2140170E, 2140171E, 2140178E, 2140179E, and 2280425; Orange County, California; WO 4805-0557	2009	El Toro
OR-03840	Marken, Mitch	Phase I Archaeological Assessment for the IRWD Baker Regional Water Treatment Plant Project, Orange County, CA	2009	El Toro, Orange
OR-03866	Tang, Tom	Identification of Known Historical/Archaeological Resources Lake Forest ADA Wheelchair Access Ramp Improvement Project (Phase IV) City of Lake Forest, Orange County, California, Project no. PW 2009.09; CRM Tech Contract #2415	2010	El Toro
OR-03950	Billat, Lorna	Hotel Furniture Liquidators, CA-ORC4024C, Collocation Submission Packet	2010	Tustin
OR-03989	Deering, Mark and Mason, Roger D.	Cultural Resources Documentation and Monitoring of Southern California Edison Access Roads During Maintenance by the Orange County Fire Authority, 2010 Orange County, California	2011	El Toro, San Juan Capistrano, Santiago Peak
OR-03992	Bray, Madeleine	Archaeological Addendum Report for the IRWD Baker Regional Water Treatment Plant Project, Orange County, CA	2010	El Toro
OR-04029	Deering, Mark and Roger Mason	Cultural Resources Monitoring of Southern California Edison Access Roads Maintained by Orange County Fire Authority, Orange County, California (JPA E6088-0031; I.O. 305869)	2010	El Toro, San Juan Capistrano, Santiago Peak
OR-04084	Fulton, Terri and Deborah McLean	Cultural Resource Assessment of 22 Natural Treatment System Facility Sites Within the San Diego Creek Watershed - Natural Treatment System Project, Irvine Ranch Water District, Orange County, California	2005	El Toro
OR-04096	Wlodarski, Robert	Record Search Results for the Proposed Bechtel Wireless Telecommunications Site LA3133 (El Toro Storage), located at 23122 El Toro Road, Lake Forest, California	2010	El Toro
OR-04169	Tnag, Tom	Identification of Known Historical/Archaeological Resources Lake Forest ADA Wheelchair Access Ramp Improvement Project (Phase V) City of Lake Forest, Orange County, California	2011	El Toro, San Juan Capistrano
OR-04182	McKenna, Jeanette	El Toro High School Archaeological Records Search	2012	El Toro
OR-04184	Maxon, Patrick	Cultural Resources for Rancho Las Lomas	2009	Santiago Peak
OR-04196	Wlodarski, Robert	LAR138 -- Manchester/Broadway, 1500 West Center Street Anaheim, CA 92802	2012	Anaheim
OR-04289	Stone, David and Victorino, Ken	Archaeological Survey Report Tertiary Treatment Plant and Recycled Water Distribution System Expansion Project Laguna Hills and Laguna Woods, Orange County, California	2012	El Toro, San Juan Capistrano
OR-04308	Smith, Brian	A Section 106 (NHPA) Cultural Resources Study for the Portola Center Project Orange County, California	2014	El Toro

Report No.	Author(s)	Title	Year	Quad Maps
OR-04336	O'Neil, Stephen	Identification and Evaluation of Historic Properties ADA Wheelchair Access Ramp Improvement Project, City of Lake Forest, Orange County, California	2012	El Toro
OR-04357	Burres, Cara L.	Paleontological and Archaeological Monitoring Report for Pacific Jack, L.L.C. - Palm Terrace, Lake Forest, California	2000	El Toro
OR-04358	Gust, Sherri	Archaeological and Paleontological Monitoring Report for Serrano Creek Business Center, Lake Forest, California	1999	El Toro
OR-04389	Brunzell, David	Cultural Resources Assessment of the Aspen Project, Lake Forest, Orange County, California (BCR Consulting Project No. TRF 1408)	2014	El Toro

APPENDIX E. PALEO SENSITIVITY CRITERIA

Potential Fossil Yield Classification (PFYC) rankings are as per the Bureau of Land Management (BLM 2008)

PFYC Description	**PFYC Rank**
Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.	1
Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.	2
Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3b
Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3a
High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.	4
Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.	5

APPENDIX F. NATIVE AMERICAN CONSULTATION

Local Government Tribal Consultation List Request

Native American Heritage Commission

1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax nahc@nahc.ca.gov

Type of List Requested: **AB 52 and SB 18**

☒ **CEQA Tribal Consultation List (AB 52)** – ***Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2***

☒ **General Plan (SB 18)** - ***Per Government Code § 65352.3.***

Local Action Type:

☒ **General Plan Update** ___ **General Plan Element** ___ **General Plan Amendment**

___ **Specific Plan** ___ **Specific Plan Amendment** ___ **Pre-planning Outreach Activity**

Required Information

Project Title: City of Lake Forest General Plan Update

Local Government/Lead Agency: The City of Lake Forest

Contact Person: Gayle Ackerman, AICP

Street Address: 25550 Commercentre Drive, Suite 100

City: Zip: 92630

Phone: (949) 461-3463 **Fax:**_None Provided

Email: GAckerman@lakeforestca.gov

Specific Area Subject to Proposed Action

County: Orange

City/Community: Lake Forest/El Toro

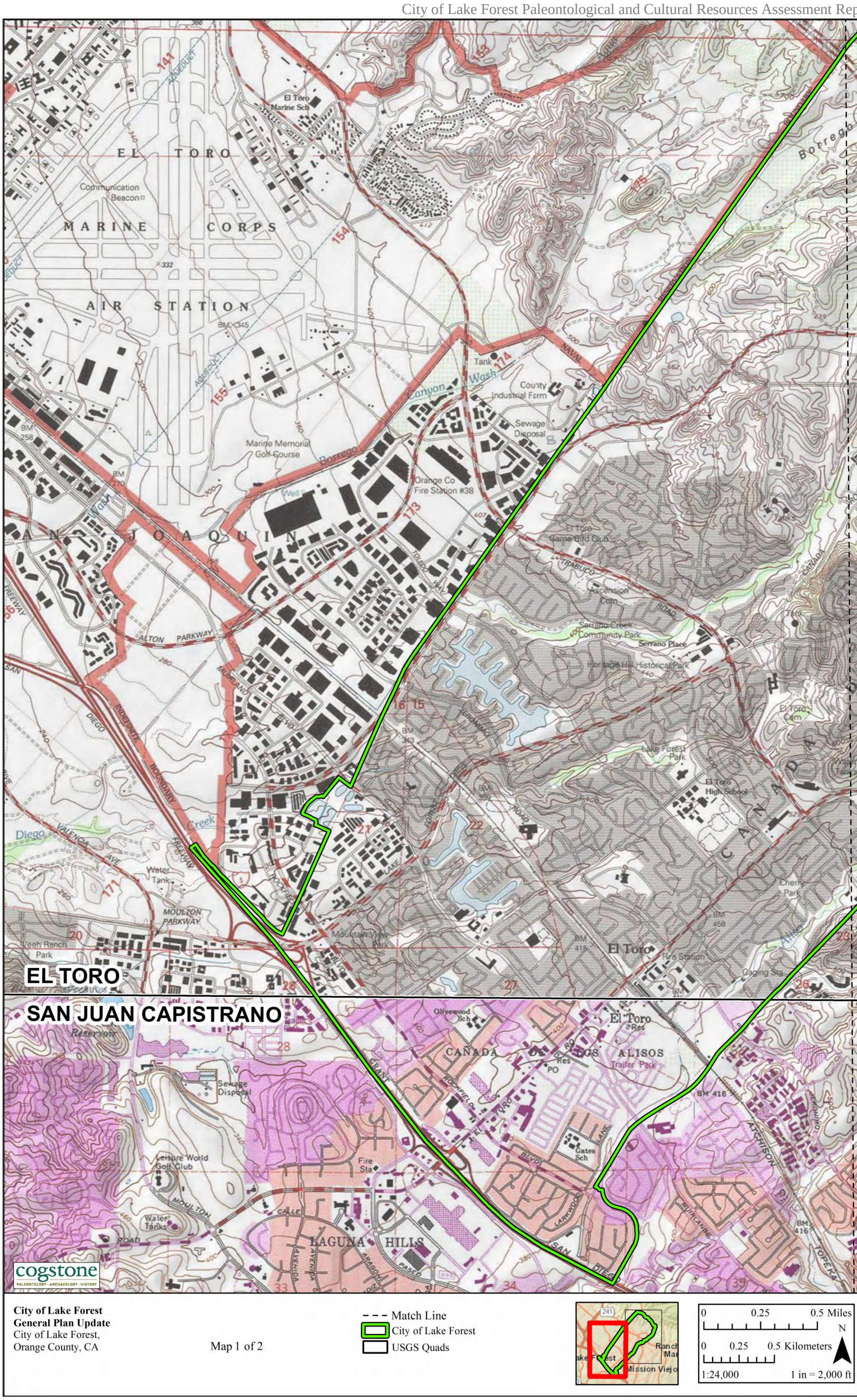
Project Description: The City of Lake Forest is updating its General Plan first adopted in 1994 to guide the physical development of the City.

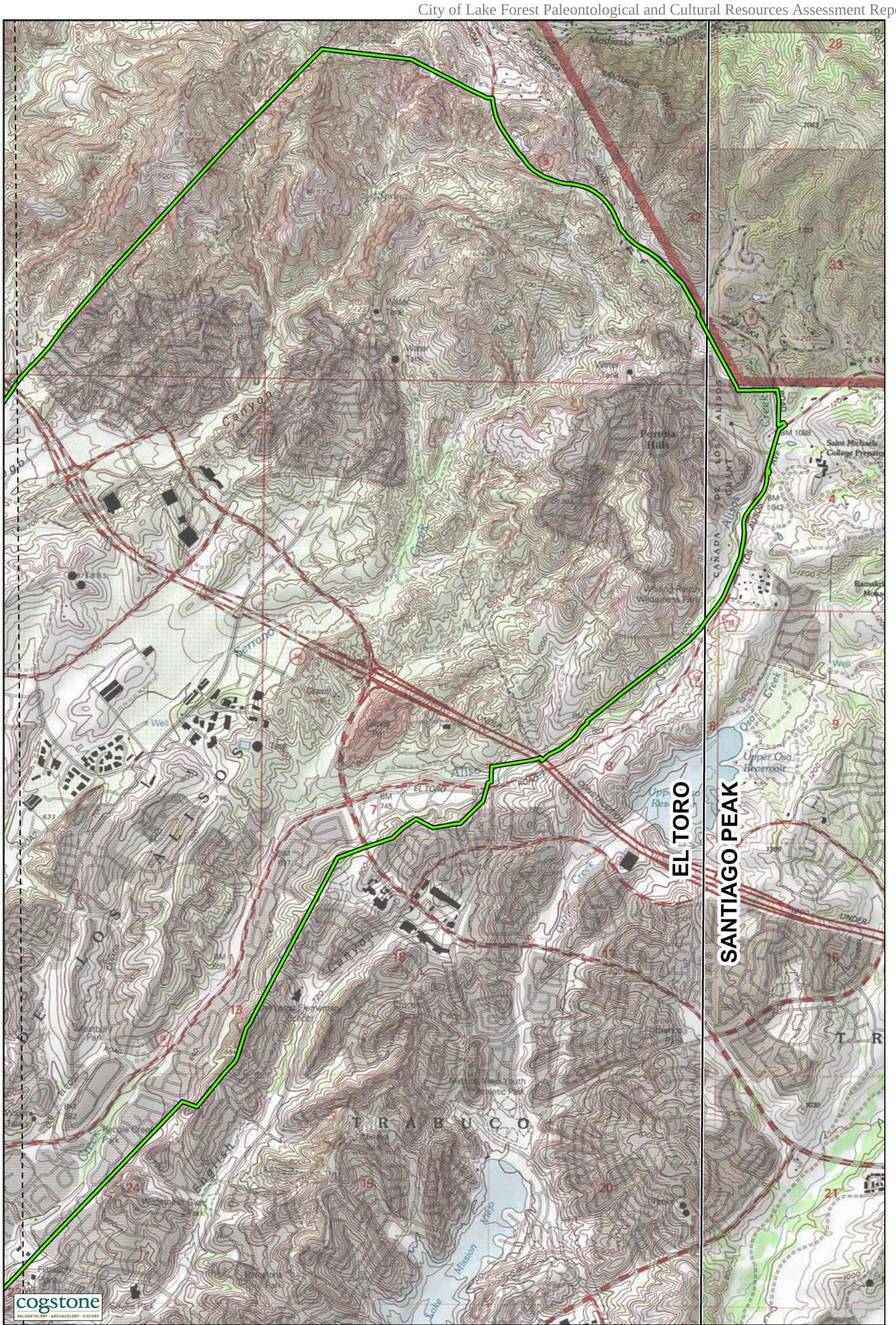
Additional Request

☒ **Sacred Lands File Search - *Required Information:***

USGS Quadrangle Name(s): El Toro, San Juan Capistrano, and Santiago Peak

TOWNSHIP	RANGE	SECTION
5 S	7W	25, 29, 30, 31, 32, 33
5 S	8 W	7, 8, 18, 25, 31, 32, 33, 36
6 S	7 W	4, 5, 6, 7, 8
6 S	8 W	1, 2, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 26, 27, 28, 34, 35


EL TORO
SAN JUAN CAPISTRANO
MARINE CORPS
AIR STATION
El Toro Marine Sch
Communication Beacon
Marine Memorial Golf Course
County Industrial Farm
Sewage Disposal
Orange Co Fire Station #38
El Toro Game Bird Club
Ascension Cem
Serrano Creek Community Park
Serrano Place
Heritage Hill Historical Park
El Toro Cem
Lake Forest Park
El Toro High School
Cherry Park
Mountain View Park
Veeh Ranch Park
Water Tank
Fire Station
Gaging Sta
Olivewood Sch
CAÑADA
ALISOS
Trailer Park
Leisure World Golf Club
Water Tanks
Fire Sta
Gates Sch
LAGUNA HILLS
cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY
City of Lake Forest
General Plan Update
City of Lake Forest,
Orange County, CA
Map 1 of 2
Match Line
City of Lake Forest
USGS Quads
0 0.25 0.5 Miles
0 0.25 0.5 Kilometers
N
1:24,000
1 in = 2,000 ft



City of Lake Forest
General Plan Update
City of Lake Forest,
Orange County, CA

Map 2 of 2

Match Line
City of Lake Forest
USGS Quads

0 0.25 0.5 Miles
0 0.25 0.5 Kilometers
1:24,000 1 in = 2,000 ft
N

STATE OF CALIFORNIA Edmund G. Brown Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

March 23, 2018

Gayle Ackerman
City of Lake Forest

Sent via e-mail: gackerman@lakeforestca.gov

RE: Proposed City of Lake Forest General Plan Update Project, City of Lake Forest; El Toro, San Juan Capistrano, and Santiago Peak USGS Quadrangles, Orange County, California

Dear Ms. Ackerman:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced project.

Government Code §65352.3 requires local governments to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose of protecting, and/or mitigating impacts to cultural places in creating or amending general plans, including specific plans. As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 require public agencies to consult with California Native American tribes identified by the NAHC for the purpose mitigating impacts to tribal cultural resources:

> Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC requests that lead agencies include in their notifications information regarding any cultural resources assessment that has been completed on a potential "area of project affect" (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.

- Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and
- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. **THIS INFORMATION IS CONFIDENTIAL. PLEASE DO NOT INCLUDE IN PUBLIC DOCUMENTS.** The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A site is recorded in the Santiago Peak USGS Quadrangle you provided that may be impacted by the project. Please contact the Juaneño Band of Mission Indians at sonia.johnston@sbcglobal.net for more information about the site. Please contact all the tribes on the attached list for potential additional sites.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

Lead agencies or agencies potentially undertaking a project are encouraged to send more than one written notice to tribes that are traditionally and culturally affiliated to a potential APE during the 30-day notification period to ensure that the information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton

Gayle Totton, M.A., PhD
Associate Governmental Program Analyst

CONFIDENTIALITY NOTICE: This communication with its contents may contain confidential and/or legally privileged information. It is solely for the use of the intended recipient(s). Unauthorized interception, review, use or disclosure is prohibited and may violate applicable laws including the Electronic Communications Privacy Act. If you are not the intended recipient, please contact the sender and destroy all copies of the communication.

Native American Heritage Commission
Tribal Consultation List
Orange County
3/23/2018

Campo Band of Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Kumeyaay
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribe
Robert Pinto, Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Ewiiaapaayp Tribe
Michael Garcia, Vice Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Kumeyaay
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
mohusky@jiv-nsn.gov

Juaneno Band of Mission Indians
Sonia Johnston, Chairperson
P.O. Box 25628 — Juaneno
Santa Ana, CA, 92799
sonia.johnston@sbcglobal.net

Juaneno Band of Mission Indians Acjachemen Nation
Matias Belardes, Chairperson
32161 Avenida Los Amigos — Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Romero
Teresa Romero, Chairperson
31411-A La Matanza Street — Juaneno
San Juan Capistrano, CA, 92675
Phone: (949) 488 - 3484
Fax: (949) 488-3294
tromero@juaneno.com

La Posta Band of Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Pauma Band of Luiseno Indians - Pauma & Yuima Reservation
Temet Aguilar, Chairperson
P.O. Box 369 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 1289
Fax: (760) 742-3422
bennaecalac@aol.com

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Sections 65352.3, 65362.4 et seq. and Public Resources Code Sections 21080.3.1 for the proposed City of Lake Forest General Plan Update Project, Orange County.

Native American Heritage Commission
Tribal Consultation List
Orange County
3/23/2018

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
P.O. Box 365 Kumeyaay
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Sycuan Band of the Kumeyaay Nation
Cody J. Martinez, Chairperson
1 Kwaaypaay Court Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Viejas Band of Kumeyaay Indians
Robert Welch, Chairperson
1 Viejas Grade Road Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Sections 65352.3, 65362.4 et seq. and Public Resources Code Sections 21080.3.1 for the proposed City of Lake Forest General Plan Update Project, Orange County.

CITY OF LAKE FOREST

Mayor
Dr. Jim Gardner

Mayor Pro Tem
Leah Basile

Council Members
Tom Cagley
Dwight Robinson
Scott Voigts

City Manager
Debra DeBruhl Rose

June 4, 2018

TEMPLATE:

RE: AB 52 Consultation Request for the General Plan Update and Environmental Impact Report for the City of Lake Forest, Orange County, California.

Dear Representative:

The City of Lake Forest (City), located in Orange County, California (Figure 1), is preparing a comprehensive General Plan Update (Project) which will encompass the entire City of Lake Forest, located south of the Saddleback Mountains (Angeles National Forest), east of the City of Irvine, north of the City of Laguna Hills, and west of the City of Mission Viejo (see Figures 2 and 3, Table 1). The existing General Plan was adopted by the City of Lake Forest in 1994 and is available on the City's website at: https://www.lakeforestca.gov/292/Planning-Documents. This General Plan Update will comply with California Environmental Quality Act (CEQA) regulations and an Environmental Impact Report (EIR) will be prepared.

We are contacting you because your Tribal Organization requested to be notified and provided information, under the provisions of the CEQA (Public Resources Code section 21080.3.1 subdivisions (b), (d) and (e)), also known as AB 52, regarding projects with the City's jurisdiction and within the traditional tribal territory of your Tribal Organization. Please consider this letter and preliminary Project information as the formal notification of the proposed Project. The City of Lake Forest is requesting to consult with the your Tribal Organization to identify tribal cultural resources that may be impacted by the proposed Project. The point of contact for the City of Lake Forest on the following page:

City of Lake Forest Point of Contact Information	
Name:	Gayle Ackerman
City:	City of Lake Forest
Address:	25550 Commercentre Drive, Suite
City, Zip:	Lake Forest, CA 92630
Tel:	(949) 461-3463
E-Mail:	GAckerman@lakeforestca.gov

The Native American Heritage Commission (NAHC) was contacted on March 22, 2018 to perform a search of the Sacred Lands File (SLF). The NAHC responded on March 23, 2018 that a sacred land is recorded on the Santiago Peak United States Geological Survey (USGS) topographic quadrangle. The NAHC also provided a list of Native American tribal contacts that may have knowledge of cultural resources within the General Plan area and recommended that we contact you, among others.

A cultural resources records search was performed at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton to identify resources within the City's limits on March 28, 2018. The results of the records search indicate that 140 cultural resources have been previously recorded within the City's limits and include: 126 prehistoric archaeological resources, five multicomponent sites, and nine historic archaeological sites.

The City would appreciate receiving any comments, issues and/or concerns relating to cultural resources, sacred lands, or tribal cultural resources located within the General Plan area. All information provided will be kept strictly confidential.

For consultation under AB 52, **please respond within 30 days from the date of this letter**, pursuant to PRC 21080.3.1(d) if you would like to consult. If you have any questions or concerns, please do not hesitant to contact Gayle Ackerman at the address above or via email GAckerman@lakeforestca.gov or phone (949) 461-3463. Thank you for your attention to this matter.

Sincerely,

Gayle Ackerman

Attachments: Figure 1. Project Vicinity Map
Figure 2. Project Location Map, aerial
Figure 3. Project Location Map, topo
Table 1. Cadastral Information

CITY OF LAKE FOREST

Mayor
Dr. Jim Gardner

Mayor Pro Tem
Leah Basile

Council Members
Tom Cagley
Dwight Robinson
Scott Voigts

City Manager
Debra DeBruhl Rose

June 4, 2018

TEMPLATE:

RE: SB 18 Consultation Request for the General Plan Update and Environmental Impact Report for the City of Lake Forest, Orange County, California.

Dear Representative:

The City of Lake Forest (City), located in Orange County, California (Figure 1), is preparing a comprehensive General Plan Update (Project) which will encompass the entire City of Lake Forest, located south of the Saddleback Mountains (Angeles National Forest), east of the City of Irvine, north of the City of Laguna Hills, and west of the City of Mission Viejo (see Figures 2 and 3, Table 1). The existing General Plan was adopted by the City of Lake Forest in 1994 and is available on the City's website at: https://www.lakeforestca.gov/292/Planning-Documents. This General Plan Update will comply with California Environmental Quality Act (CEQA) regulations and an Environmental Impact Report (EIR) will be prepared..

We are requesting consultation under Senate Bill 18 (Chapter 905, Statutes of 2004) which requires local governments to consult with tribes prior to making certain planning decisions and requires consultation and notice for a general and specific plan adoption or amendment to preserve, or mitigate impacts to, cultural places that may be affected. The Native American Heritage Commission (NAHC) provided us with a list of tribal entities and individuals who have requested to be placed on the SB 18 consultation list. Your Tribal Organization is on the list provided. As a result, please consider this letter as a notice of the project and an invitation to provide comments regarding the project. The point of contact for the City of Lake Forest is:

City of Lake Forest Point of Contact Information	
Name:	Gayle Ackerman
City:	City of Lake Forest
Address:	25550 Commercentre Drive, Suite
City, Zip:	Lake Forest, CA 92630
Tel:	(949) 461-3463
E-Mail:	GAckerman@lakeforestca.gov

DRUG USE IS LIFE ABUSE

The Native American Heritage Commission (NAHC) was contacted on March 22, 2018 to perform a search of the Sacred Lands File (SLF). The NAHC responded on March 23, 2018 that a sacred land is recorded on the Santiago Peak United States Geological Survey (USGS) topographic quadrangle.

A cultural resources records search was performed at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton to identify resources within the City's limits on March 28, 2018. The results of the records search indicate that 140 cultural resources have been previously recorded within the City's limits and include: 126 prehistoric archaeological resources, five multicomponent sites, and nine historic archaeological sites.

The City would appreciate receiving any comments, issues and/or concerns relating to cultural resources, sacred lands, or tribal cultural resources located within the General Plan area. All information provided will be kept strictly confidential.

P**lease respond within 90 days from the date of this letter** if you would like to consult. If you have any questions or concerns, please do not hesitant to contact Gayle Ackerman at the address above or via email GAckerman@lakeforestca.gov or phone (949) 461-3463. Thank you for your attention to this matter.

Sincerely,

Gayle Ackerman

Attachments: Figure 1. Project Vicinity Map
Figure 2. Project Location Map, aerial
Figure 3. Project Location Map, topo
Table 1. Cadastral Information

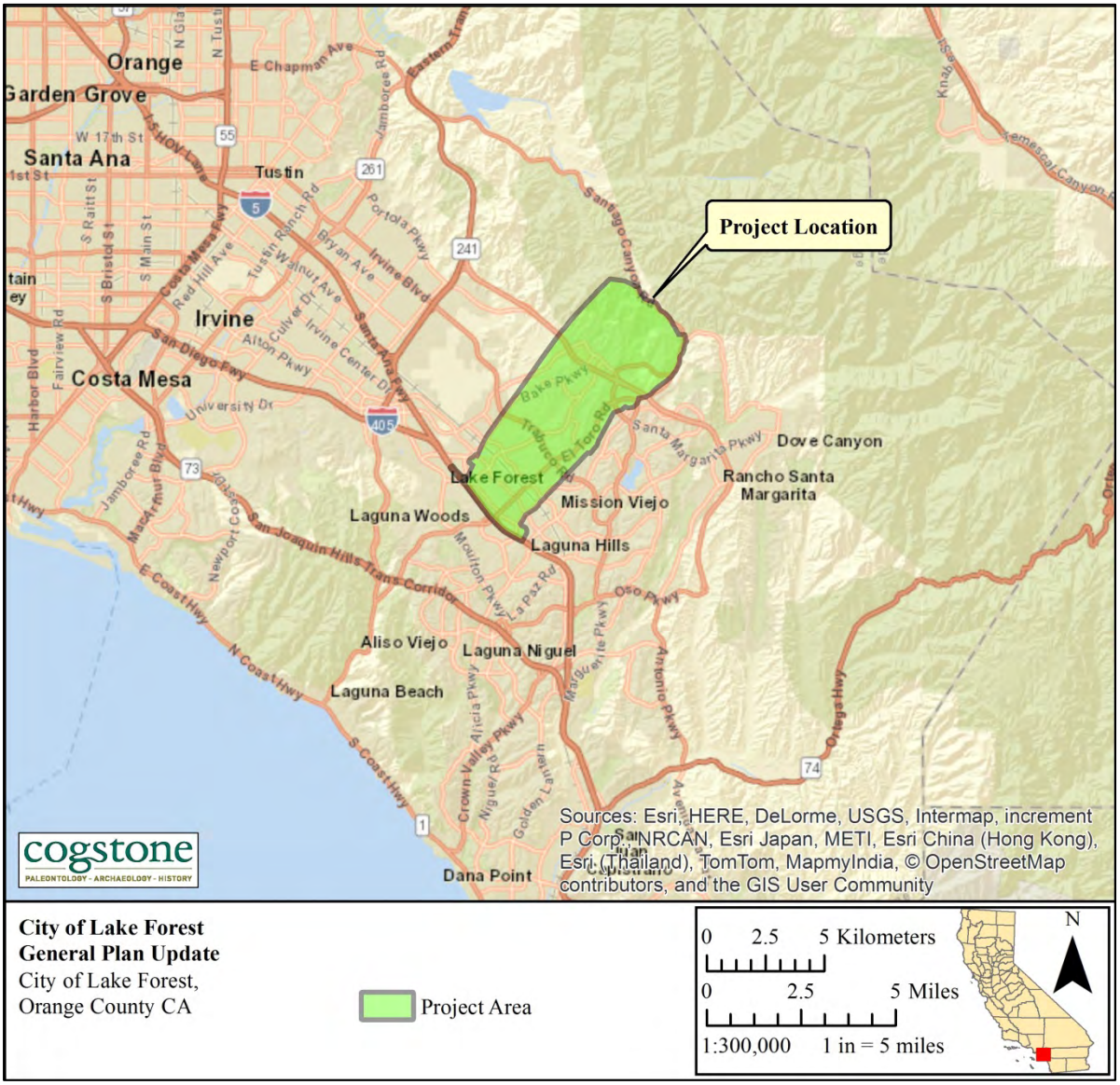


Figure 1. Project Vicinity Map

Table 1. Cadastral Information

TOWNSHIP	RANGE	SECTION
5 S	7W	25, 29, 30, 31, 32, 33
5 S	8 W	7, 8, 18, 25, 31, 32, 33, 36
6 S	7 W	4, 5, 6, 7, 8
6 S	8 W	1, 2, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 26, 27, 28, 34, 35

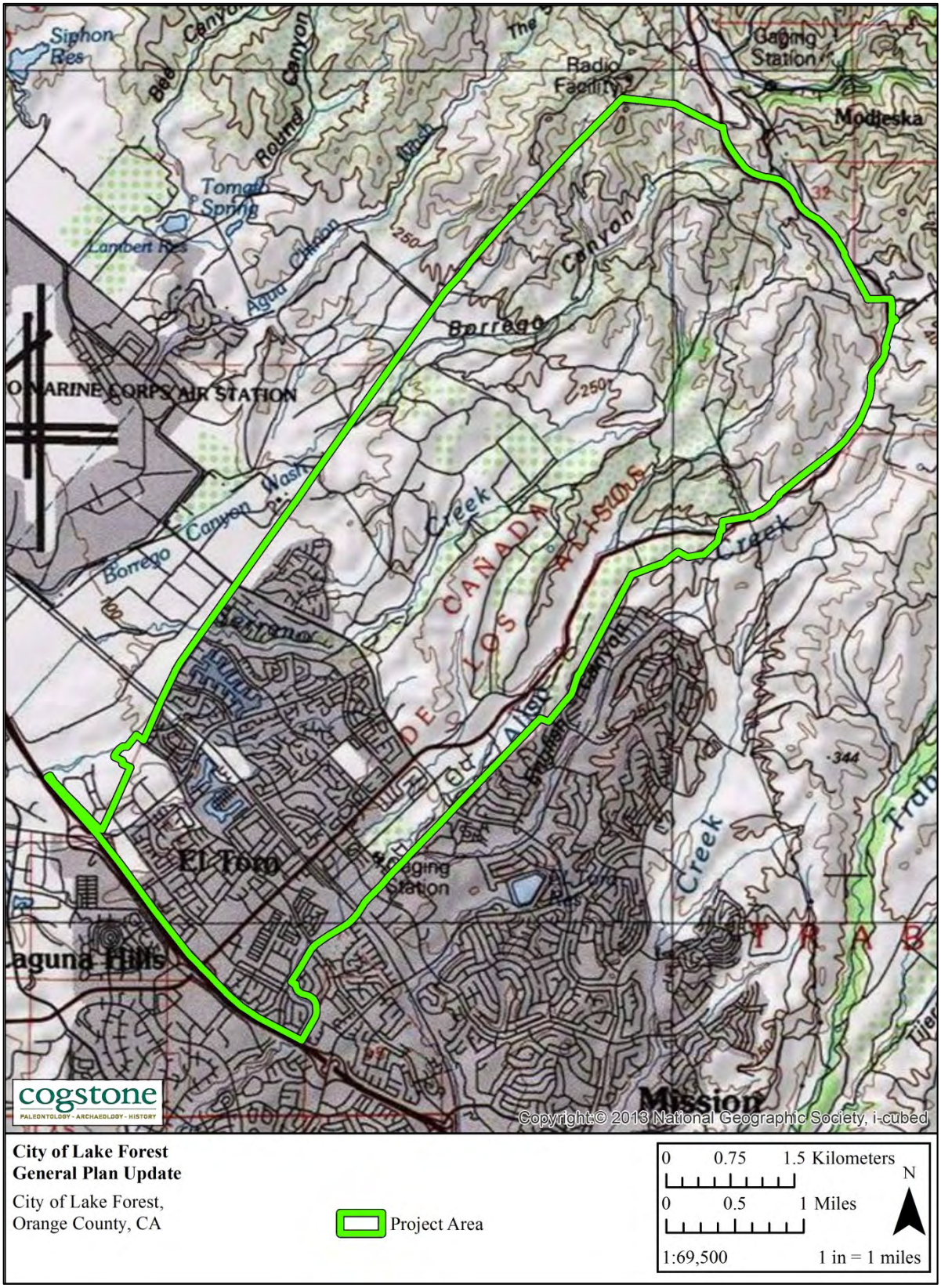
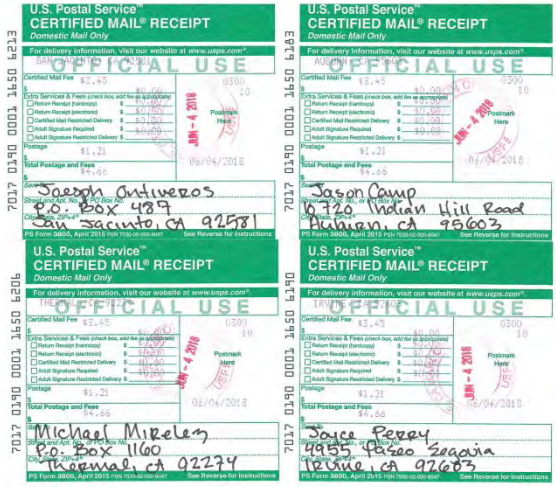


Figure 2. Project Location Map

Figure 3. Project Aerial Map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Irvine, CA 92603

SB18

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Alpine, CA 91901
Savanaugh Miller
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Boulevard, CA 91905
Ralph Goff
36190 Church Road
Campo, CA 91906
Cody Martinez
Kwaaypaay Court
El Cajon, CA 92019
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Ulejas Grande Rd.
Alpine, CA 91901
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Gwendolyn Parada
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Boulevard, CA 91905
Michael Garcia
9054 Willows Road
Alpine, CA 91901

AB52

Native American Consultation Log

Tribal Organization	Type of Request	Date(s) and Method of First Contact Attempt	Date(s) and Method of Second Attempt	Date(s) and Method of Third Attempt	Date(s) of Replies Rec'd
Campo Band of Mission Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Ewiiaapaayp Band of Kumeyaay Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Jamul Indian Village, Erica Pinto, Chairperson	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, phone conversation	On July 18, 2018 the receptionist of the Jamul Indian Village indicated that the City of Lake Forest is off their reservation and outside of their traditional tribal territory and defers to local Tribes.
Juaneño Band of Mission Indians Acjachemen Nation : Belardes/Perry	AB 52	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail and email: additional emails and 8/20 and 8/31 2018. Phone conversation 8/31/2018	On August 31, 2018 Ms. Joyce Perry of the Juaneño Band of Mission Indians Acjachemen Nation, via phone conversation, requested that the City of Lake Forest notify the Tribe regarding any development projects located within the City limits. She informed that the Santa Ana foothills and area around the Aliso Creek watershed are extremely sensitive for Tribal Cultural resources including ancestor remains.
Juaneño Band of Mission Indians Acjachemen Nation: Romero	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail and email: additional emails sent 8/20 and 8/31, 2018	No response.
Juaneño Band of Mission Indians: Johnston	SB 18	August 18, 2018	-	-	No response.

Tribal Organization	Type of Request	Date(s) and Method of First Contact Attempt	Date(s) and Method of Second Attempt	Date(s) and Method of Third Attempt	Date(s) of Replies Rec'd
La Posta Band of Mission Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Manzanita Band of Kumeyaay Nation	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail and email	No response.
Pauma Band of Luiseno Indians - Pauma & Yuima Reservation	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
San Pasqual Band of Mission Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Soboba Band of Luiseno Indians	AB 52	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Sycuan Band of the Kumeyaay Nation	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
Torres Martinez Desert Cahuilla Indians	AB 52	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	No response.
United Auburn Indian Community of the Auburn Rancheria	AB 52	June 4, 2018, certified mail	June 26, 2018, email	August 31, 2018, email	On August 31, 2018, Mr. Marcos Guerrero indicated that he beloved the UAIC was placed on the City of Forest/Orange County lists by accident.
Viejas Band of Kumeyaay Indians	SB 18	June 4, 2018, certified mail	June 26, 2018, email	July 18, 2018, voicemail	On June 12, 2018 Mr. Ray Teran indicated that Tribe as determined that the project has little cultural significance of ties to the Viejas Tribe. He recommended that local Tribes be consulted.

VIEJAS
TRIBAL GOVERNMENT

P.O Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 619.445.3810
Fax: 619.445.5337
viejas.com

RECEIVED
JUN 25 2018
CITY OF LAKE FOREST
DEVELOPMENT SERVICES DEPT.

June 12, 2018

Gayle Ackerman
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

RE: SB 18 Consultation Request for General Plan Update and Environmental Impact Report for the City of Lake Forest

Dear Ms. Ackerman,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has little cultural significance or ties to Viejas. We further recommend that you contact the tribe(s) closest to the cultural resources. We, however, request to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order for us to reevaluate our participation in the government-to-government consultation process.

Please do not hesitate to contact me if you have further questions. Please call Ernest Pingleton at 619-659-2314 or me at 619-659-2312, or email, epingleton@viejas-nsn.gov or rteran@viejas-nsn.gov. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

From: Marcos Guerrero
To: Megan Wilson
Subject: RE: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest
Date: Friday, August 31, 2018 3:34:26 PM

Thanks Megan this helps.
Mg

From: Megan Wilson [mailto:mwilson@cogstone.com]
Sent: Friday, August 31, 2018 11:13 AM
To: Marcos Guerrero <mguerrero@auburnrancheria.com>
Subject: RE: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest

Good morning Mr. Guerrero,
The Contact information for the City of Lake Forest is provided below.

City of Lake Forest Point of Contact Information	
Name:	Gayle Ackerman
City:	City of Lake Forest
Address:	25550 Commercentre Drive, Suite
City, Zip:	Lake Forest, CA 92630
Tel:	(949) 461-3463
E-Mail:	GAckerman@lakeforestca.gov

Thank you for your attention to this matter,
Megan

From: Marcos Guerrero [mailto:mguerrero@auburnrancheria.com]
Sent: Friday, August 31, 2018 9:49 AM
To: Megan Wilson; Jason Camp
Cc: Matthew Moore
Subject: RE: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest

Hello Megan,
I think UAIC may have gotten on the City of Forest /Orange County list by accident. I will follow up with the NAHC and City of Lake Forest to make this correction.
If there is a contact person at the City of Forest, please share their information. Best,
Marcos

From: Megan Wilson [mailto:mwilson@cogstone.com]
Sent: Friday, August 31, 2018 9:02 AM
To: Jason Camp <jcamp@auburnrancheria.com>
Cc: Marcos Guerrero <mguerrero@auburnrancheria.com>
Subject: Confirmation the United Auburn Indian Community wished to Consult with the City of Lake Forest

Good Morning,
On behalf of the City of Lake Forest, located in Orange County, CA, I want to confirm that the United Auburn Indian Community wished to consult with the City regarding Projects within their jurisdiction under AB52.
Please confirm via email, or phone that the City of Lake Forest is a City your Tribe wished to consult with.
Thank you,

cogstone™
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

Federal Certifications SDB, EDWOSB
State Certifications DBE, WBE, SBE, UDBE

Megan Wilson, MA, RPA
Archaeologist/GIS Technician
11518 W Taft Ave, Orange, CA 92865
714-974-8300 ex 108 office
mwilson@cogstone.com www.cogstone.com
Field Offices in San Diego, Riverside, Morro Bay, San Francisco

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Appendix E

Noise Background Report

Lake Forest General Plan Update – Noise Background Report

City of Lake Forest, California

May 30, 2018

Project # 180206

Prepared for:

De Novo Planning Group
180 E Main Street, Suite 108
Tustin, CA 92780

Prepared by:

Saxelby Acoustics

Luke Saxelby, INCE Bd. Cert.
Principal Consultant
Board Certified, Institute of Noise Control Engineering (INCE)

(916) 760-8821
www.SaxNoise.com | Luke@SaxNoise.com
915 Highland Pointe Drive, Suite 250
Roseville, CA 95678

This section provides a discussion of the regulatory setting and a general description of existing noise sources in the City of Lake Forest Lake Forest. The analysis in this section was prepared with assistance from Saxelby Acoustics.

3.11.1 ENVIRONMENTAL SETTING

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared. All dB levels used in this report are A-weighted values, unless otherwise stated.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by + 5 dB and nighttime hours weighted by +10 dB. Typically, 1 dB higher than Ldn for transportation noise sources.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50 percent of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptor, Ldn, and shows very good correlation with community response to noise.

The day/night average level (Ldn) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because Ldn represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to Ldn, but

includes a +3 dB penalty for evening noise. Table 3.11-1 lists several examples of the noise levels associated with common situations.

TABLE 3.11-1: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (dBA)	COMMON INDOOR ACTIVITIES
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. SEPTEMBER 2013.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e. atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

EXISTING NOISE LEVELS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction model (FHWA-RD 77-108) was used to develop community noise equivalent level (CNEL) noise contours for all highways and major roadways in the General Plan study area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA model predicts hourly L_{eq} values for free-flowing traffic conditions and is generally considered to be accurate within 1.5 dB. To predict CNEL values, it is necessary to determine the day/evening/night distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the General Plan study area. Day/evening/night traffic distributions were based upon continuous hourly noise measurement data. Caltrans vehicle truck counts were obtained for Interstate 5 and Route 241. Arterial roadway truck percentages were obtained from vehicle classification count data provided by the traffic engineer. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 3.11-2 shows the results of this analysis.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each project-area roadway segments. In some locations sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of the majority of sensitive receptors located closest to the project-area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 3.11-2 are generally considered to be conservative estimates of noise exposure along roadways in the City of Lake Forest Lake Forest. Figure 3.8-1 shows existing citywide traffic noise contours.

TABLE 3.11-2: PREDICTED EXISTING TRAFFIC NOISE LEVELS

ROADWAY SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, LDN)[1]	DISTANCES TO TRAFFIC NOISE CONTOURS, LDN (FEET)		
		60 DB	65 DB	70 DB
Trabuco w/o Lake Forest	61.9	288	134	62
Trabuco w/o Ridge Route	63.9	295	137	64
Trabuco w/o El Toro	64.4	319	148	69
Trabuco e/o El Toro	61.0	250	116	54
Toledo w/o Lake Forest	56.4	125	58	27
Toledo e/o Lake Forest	60.8	121	56	26
Toledo e/o Ridge Route	59.7	103	48	22
Jeronimo w/o Lake Forest	63.2	177	82	38
Jeronimo w/o Ridge Route	60.7	144	67	31
Jeronimo w/o El Toro	62.2	151	70	33
Jeronimo e/o El Toro	64.0	198	92	43
Muirlands w/o Lake Forest	61.7	181	84	39
Muirlands w/o Ridge Route	63.1	208	96	45
Muirlands e/o Ridge Route	62.2	227	105	49
Muirlands e/o El Toro	64.5	235	109	51
Rockfield w/o Lake Forest	66.2	257	119	55
Rockfield w/o Ridge Route	69.7	222	103	48
Rockfield w/o El Toro	63.3	231	107	50
Rockfield w/o Los Alisos	60.7	155	72	33
Portola w/o Alton Pkwy	57.7	151	70	32
Portola w/o Bake	59.0	220	102	47
Portola w/o Lake Forest	60.5	269	125	58
Portola w/o Glenn Ranch	66.6	331	153	71
Portola n/o SR-241	60.5	281	131	61
Portola s/o SR-241	60.9	297	138	64
Portola w/o El Toro	60.3	406	189	88
Portola e/o El Toro	61.3	423	196	91
Rancho South w/o Bake	59.8	97	45	21
Rancho e/o Bake	63.9	181	84	39
Rancho e/o Lake Forest	61.0	226	105	49
Glenn n/o Portola to s/o Saddleback Ranch Road	59.8	239	111	51

TABLE 3.11-2: PREDICTED EXISTING TRAFFIC NOISE LEVELS

ROADWAY SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, LDN)[1]	DISTANCES TO TRAFFIC NOISE CONTOURS, LDN (FEET)		
		60 DB	65 DB	70 DB
Glenn Ranch w/o El Toro n/o Saddleback Ranch Road	56.0	135	63	29
Alton s/o Portola	57.3	143	66	31
Alton s/o SR-241	66.8	311	144	67
Alton s/o Rancho South	68.0	411	191	89
Alton n/o Trabuco	64.7	488	226	105
Bake s/o Towne Centre Drive	69.3	352	164	76
Bake n/o Commercentre	63.7	381	177	82
Bake s/o Commercentre	64.1	404	188	87
Bake s/o Trabuco	66.5	499	232	107
Bake s/o Toledo	63.6	521	242	112
Lake Forest s/o Portola	63.9	183	85	39
Lake Forest n/o Rancho	66.8	285	132	61
Lake Forest s/o Rancho	65.9	309	143	67
Lake Forest n/o Trabuco	65.6	408	189	88
Lake Forest s/o Trabuco	65.6	383	178	83
Lake Forest n/o Jeronimo	65.9	398	185	86
Lake Forest n/o Muirlands	65.4	395	183	85
Lake Forest s/o Muirlands	63.4	273	127	59
Lake Forest s/o Rockfield	68.7	381	177	82
Ridge Route n/o Toledo	58.2	90	42	19
Ridge Route n/o Jeronimo	58.7	97	45	21
Ridge Route s/o Jeronimo	61.8	100	46	21
Ridge Route n/o Muirlands	56.4	92	43	20
Ridge Route n/o Rockfield	57.8	92	43	20
Ridge Route s/o Rockfield	53.5	47	22	10
El Toro n/o Glenn Ranch	61.7	233	108	50
El Toro s/o Glenn Ranch	62.3	284	132	61
El Toro n/o Sta Margarita	63.0	271	126	58
El Toro s/o Sta Margarita	64.8	406	188	87
El Toro n/o Trabuco	68.4	399	185	86
El Toro s/o Trabuco	66.0	436	202	94
El Toro n/o Jeronimo	72.4	437	203	94

TABLE 3.11-2: PREDICTED EXISTING TRAFFIC NOISE LEVELS

ROADWAY SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (DB, LDN)[1]	DISTANCES TO TRAFFIC NOISE CONTOURS, LDN (FEET)		
		60 DB	65 DB	70 DB
El Toro n/o Moorlands	70.5	453	210	98
El Toro s/o Muirlands	64.2	309	143	67
El Toro s/o Rockfield	68.2	350	163	75
Los Alisos n/o Jeronimo	63.9	294	137	63
Los Alisos n/o Muirlands	63.6	301	140	65
Los Alisos s/o Muirlands	64.1	283	131	61
Los Alisos s/o Rockfield	65.9	267	124	58
Commercentre e/o Alton	67.5	173	80	37
Dimension n/o Commercentre	60.5	108	50	23
Dimension s/o Commercentre	63.3	167	77	36
Commercentre e/o Bake	64.0	185	86	40
Commercentre w/o Dimension	61.4	124	57	27
Interstate 5	72.2	3326	1544	717
Route 241	62.4	712	330	153

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.
[1] TRAFFIC NOISE LEVELS ARE PREDICTED AT THE CLOSEST SENSITIVE RECEPTORS
SOURCE: KITTELSON & ASSOCIATES, INC., CALTRANS, AND SAXELBY ACOUSTICS

Railroad Noise Levels

To quantify noise exposure from existing train operations, a continuous (24-hour) noise level measurement survey was conducted along the existing Metrolink commuter rail tracks. Based upon the current online schedules, approximately 7 commuter trains travel this line during nighttime (10:00 p.m. – 7:00 a.m.) with 63 daytime (7:00 a.m. – 10:00 p.m.) trains. Noise measurement data also indicated approximately 5 freight trains per day.

The purpose of the noise level measurements was to determine typical sound exposure levels (SEL) for railroad line operations, while accounting for the effects of travel speed, warning horns and other factors which may affect noise generation. In addition, the noise measurement equipment was programmed to identify individual train events, so that the typical number of train operations could be determined.

Table 3.11-3 shows a summary of the continuous noise measurement results for railroad activity within the City.

TABLE 3.11-3: RAILROAD NOISE MEASUREMENT RESULTS				
MEASUREMENT LOCATION	RAILROAD TRACK	GRADE CROSSING /WARNING HORN	TRAIN EVENTS PER 24-HR PERIOD	AVERAGE SEL AT 75
LT-2	Metrolink	No grade crossing. Occasional horn usage.	75 (54 day, 13 night, 8 evening)	94 dBA

SOURCE: SAXELBY ACOUSTICS - 2018

Noise measurement equipment consisted of Larson Davis Laboratories (LDL) model 831 precision integrating sound level meters equipped with a GRAS ½" microphone. The measurement system was calibrated using a B&K 4230 acoustical calibrator before and after testing. Audio recordings of events were captured along with sound measurement data to help with source identification of events. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

To determine the distances to the CNEL railroad contours, it is necessary to calculate the CNEL for typical train operations. This was done using the SEL values and above-described number and distribution of daily train operations. The Ldn may be calculated as follows:

$$Ldn = SEL + 10 \log N_{eq} - 49.4 \text{ dB, where:}$$

SEL is the mean Sound Exposure Level of the event, N_{eq} is the sum of the number of daytime (7 a.m. to 7 p.m.) events, plus 3.163 times the number of evening (7 p.m. to 10 p.m.) events, plus 10 times the number of nighttime (10 p.m. to 7 a.m.) events per day, and 49.4 is ten times the logarithm of the number of seconds per day. Based upon the above-described noise level data, number of operations and methods of calculation, the CNEL value for railroad line operations have been calculated, and the distances to the CNEL noise level contours are shown in Table 3.11-4.

TABLE 3.11-4: APPROXIMATE DISTANCES TO THE RAILROAD NOISE CONTOURS			
EXTERIOR NOISE LEVEL AT 75 FEET, L_{DN}	DISTANCE TO EXTERIOR NOISE LEVEL CONTOURS, FEET		
	60 dB L_{DN}	65 dB L_{DN}	70 dB L_{DN}
METROLINK LINE			
68 dB	264’	123’	57’

SOURCE: SAXELBY ACOUSTICS - 2018.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by federal and state employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day and existing ambient noise levels.

In the City of Lake Forest Lake Forest, fixed noise sources typically include parking lots, loading docks, parks, schools, and other commercial/retail use noise sources (HVAC, exhaust fans, etc.)

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified music and voice

The types of uses which may typically produce the noise sources described above, include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, special events such as concerts, and athletic fields. Typical noise levels associated with various types of stationary noise sources are shown in Table 3.11-3.

Table 3.11-4: Typical Stationary Source Noise Levels

USE	NOISE LEVEL AT 100 FEET, LEQ [1]	DISTANCE TO NOISE CONTOURS, FEET			
		50 DB LEQ (NO SHIELDING)	45 DB LEQ (NO SHIELDING)	50 DB LEQ (WITH 5 DB SHIELDING)	45 DB LEQ (WITH 5 DB SHIELDING)
Auto Body Shop	56 dB	200	355	112	200
Auto Repair (Light)	53 dB	141	251	79	141
Busy Parking Lot	54 dB	158	281	89	158
Cabinet Shop	62 dB	398	708	224	398
Car Wash	63 dB	446	792	251	446
Cooling Tower	69 dB	889	1,581	500	889
Loading Dock	66 dB	596	1,059	335	596
Lumber Yard	68 dB	794	1,413	447	794
Maintenance Yard	68 dB	794	1,413	447	794
Outdoor Music Venue	90 dB	10,000	17,783	5,623	10,000
Paint Booth Exhaust	61 dB	355	631	200	355
Skate Park	60 dB	316	562	178	316
School Playground / Neighborhood Park	54 dB	158	281	89	158
Truck Circulation	48 dB	84	149	47	84
Vendor Deliveries	58 dB	251	446	141	251

[1] Analysis assumes a source-receiver distance of approximately 100 feet, no shielding, and flat topography. Actual noise levels will vary depending on site conditions and intensity of the use. This information is intended as a general rule only, and is not suitable for final site-specific noise studies.

Source: Saxelby Acoustics 2018.

COMMUNITY NOISE SURVEY

A community noise survey was conducted to document ambient noise levels at various locations throughout the City. Short-term noise measurements were conducted at six locations throughout the City on April 18 and April 19, 2018 during daytime (7 am – 10 pm) and nighttime (10 pm - 7 am) periods. In addition, four continuous 24-hour noise monitoring sites were also conducted to record day-night statistical noise level trends. The data collected included the hourly average (Leq), median (L50), and the maximum level (Lmax) during the measurement period. Noise monitoring sites and the measured noise levels at each site are summarized in Table 3.11-5 and Table 3.11-6. Figure 3.11-2 shows the locations of the noise monitoring sites.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) model 812, 820, and 831 precision integrating sound level meters equipped with ½" microphones. The measurement systems were calibrated using a B&K model 4230 acoustical calibrator before and after testing. The measurement equipment meets all of the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

TABLE 3.11-5: EXISTING CONTINUOUS 24-HOUR AMBIENT NOISE MONITORING RESULTS

SITE	LOCATION	CNEL (DBA)	MEASURED HOURLY NOISE LEVELS, DBA LOW-HIGH (AVERAGE)					
			DAYTIME (7:00 AM - 10:00 PM)			NIGHTTIME (10:00 PM – 7:00 AM)		
			LEQ	L50	LMAX	LEQ	L50	LMAX
1	24621 Bridger Road, 220 feet to I-5 centerline. Partially screened by 16 foot tall sound wall.	72	62-69 (67)	61-68 (67)	71-76 (74)	58-69 (64)	57-69 (62)	64-74 (69)
2	Open space near west end of Shadowfax Drive - 75' to railroad line.	69	57-69 (63)	42-49 (46)	84-101 (89)	35-68 (62)	35-47 (40)	40-92 (78)
3	Skate Park of Etnies Lake Forest, 150' to CL Route 241	62	56-61 (60)	54-61 (58)	69-78 (72)	47-59 (53)	37-56 (45)	66-74 (69)
4	350' South of Portola, 140' to CL of El Toro, on west side of El Toro	61	55-60 (58)	53-58 (55)	70-88 (76)	45-57 (52)	39-55 (46)	61-80 (69)

SOURCE – SAXELBY ACOUSTICS– 2018.

TABLE 3.11-6: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS

SITE	LOCATION	TIME[1]	MEASURED SOUND LEVEL, DB			NOTES
			LEQ	L50	LMAX	
1	Mountain View Park	4:36 p.m.	52	51	59	Park noise. Kids playing. Local traffic. Single engine aircraft overflight, 50-55 dBA.
		11:47 p.m.	44	44	48	Distant traffic. Jet overflight. HNL to ORD. Jets around 45-46 dBA. LAX to Miami.
2	Heroes Park	5:07 p.m.	56	55	65	Ball fields. Traffic. Driving range. Ball "whacks." Single engine aircraft. Two Amtrak passenger trains.
		12:07 a.m.	44	42	52	Traffic. Jet, LAX to ORD. Sprinklers at park.
3	Rancho Serrano Park	3:52 p.m.	47	44	63	Traffic noise from Bake Pkwy. Single engine airplane overflights. High flying jet, LAX to Atlanta.
		11:27 p.m.	42	40	53	Distant traffic. Sprinklers 37 dBA. Jets, 42 dBA. LAX to NYC. LAX to Washington IAD. LAX to Boston. LAX to Toronto.
4	Autumn Glenn & Lake Forest – 120 feet to centerline of Lake Forest	3:31 p.m.	58	56	71	Traffic on Forest Lake dominant. 6' wall at play area. Site of meter not fully shielded.
		11:01 p.m.	52	49	65	Sprinklers 43-47 dBA. Traffic. Jet overflight. LAX to NC
5	Foothill Ranch Community Park	2:01 p.m.	49	47	58	Light breeze. Birds. Helicopter flyover to south. No kids at play equipment. Local traffic. Skater at hockey rink.
		10:41 p.m.	39	37	51	Distant and local traffic.
6	Santiago Canyon Park	2:52 p.m.	47	43	59	Distant and local traffic.
		10:16 p.m.	43	38	60	Distant and local traffic.

1 - ALL COMMUNITY NOISE MEASUREMENT SITES HAVE A TEST DURATION OF 10:00 MINUTES.

SOURCE - SAXELBY ACOUSTICS 2018.

The results of the community noise survey shown in Table 3.11-5 and 3.11-6 indicate that existing transportation (traffic) noise sources were the major contributor of noise observed during daytime hours, especially during vehicle pass-bys. Additionally, while frequent jet aircraft overlflights from the Los Angeles International Airport (LAX) were audible, with typical noise levels of 42-47 dBA.

REGULATORY FRAMEWORK

FEDERAL

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for federally funded roadway projects or projects that require federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

Environmental Protection Agency (EPA)

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an Leq of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an Leq of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA Ldn as the basic goal for residential environments. However, other federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA Ldn, have generally agreed on the 65 dBA Ldn level as being appropriate for residential uses. At 65 dBA Ldn activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The Department of Housing and Urban Development (HUD) was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Housing and Urban Development Act of 1965 (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA Ldn or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA Ldn but not exceeding 75 dBA Ldn - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA Ldn area and 10 dBA of attenuation in a 70 to 75 dBA Ldn area.
- Exceeding 75 dBA Ldn - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a goal of 45 dBA Ldn is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA Ldn or less, the interior level will be 45 dBA Ldn or less. Thus, structural attenuation is assumed at 20 dBA. However HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

STATE

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 2011). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

Governor's Office of Planning and Research (OPR)

OPR has developed guidelines for the preparation of general plans (Office of Planning and Research, 2003). The guidelines include land use compatibility guidelines for noise exposure.

LOCAL

Existing City Noise Thresholds

The City of Lake Forest Lake Forest General Plan Safety and Noise Element (June 21, 1994) establishes goals and policies, as well as criteria for evaluating the compatibility of individual land uses with respect to noise exposure. The intent is to provide guidance for determining noise impacts due to, and upon proposed projects. The existing Guiding Principles and Policies of the City's General Plan Noise Element are provided below:

> ***Noise Standards and Land Use Compatibility Guidelines***
> *To ensure that noise producers do not adversely affect sensitive receptors, the City will use land use compatibility standards when making planning and development decisions. Table SN-2 summarizes City noise standards for various types of land uses. The standards represent the maximum allowable noise level and will be used to determine noise impacts. The noise standards act as City policy for acceptable noise levels for development.*
>
> *The noise standards are the basis for the development of land use compatibility guidelines, which are presented in a matrix in Table SN-3. The primary purpose of the*

noise/land use potential conflicts between proposed land uses and the existing and future noise environment. If the noise level of a project falls within Zone A or Zone B, the project is considered compatible with the noise environment. Zone A implies that no mitigation will be needed. Zone B implies that minor soundproofing of the structure may be needed to meet the City noise standards. The project proponent will be required to demonstrate that the noise standards will be met prior to project approval.

If the noise level of a project falls within Zone C, substantial noise mitigation will be necessary to meet the noise standards. Mitigation may involve construction of noise barriers and substantial building sound insulation. However, projects in Zone C can be successfully mitigated. The project proponent must demonstrate that the noise standards will be met prior to issuance of a building permit. If the noise levels falls outside of Zones A, B and C, the project is considered clearly incompatible with the noise environment and should not be approved.

TABLE 3.11-7: LAKE FOREST SAFETY AND NOISE ELEMENT TABLE SN-2: INTERIOR AND EXTERIOR NOISE STANDARDS

LAND USE	NOISE STANDARDS (1)	
	INTERIOR (2,3)	EXTERIOR
Residential: Single-Family, Multifamily, Duplex, Mobile Home	CNEL 45 dB	CNEL 65 dB (4)
Residential: Transient Lodging, Hotels, Motels, Nursing Homes, Hospitals	CNEL 45 dB	CNEL 65 dB (4)
Private Offices, Church Sanctuaries, Libraries, Board Rooms, Conference Rooms, Theaters, Auditoriums, Concert Halls, Meeting Halls, etc.	Leq(12) 45 dB(A) (6)2	—
Schools	Leq(12) 45 dB(A)	Leq(12) 67 dB(A) (5)
General Offices, Reception, Clerical, etc.	Leq(12) 50 dB(A)	—
Bank Lobby, Retail Store, Restaurant, Typing Pool, etc.	Leq(12) 55 dB(A)	—
Manufacturing, Kitchen, Warehousing, etc.	Leq(12) 65 dB(A)	—
Park, Playgrounds	—	CNEL 65 dB (5)
Golf Courses, Outdoor Spectator Sports, Amusement Parks	—	CNEL 70 dB (5)

NOTES

(1) CNEL: COMMUNITY NOISE EQUIVALENT LEVEL.
LEQ(12): THE A-WEIGHTED EQUIVALENT SOUND LEVEL AVERAGED OVER A 12-HOUR PERIOD (USUALLY THE HOURS OF OPERATION).

(2) NOISE STANDARD WITH WINDOWS CLOSED. MECHANICAL VENTILATION SHALL BE PROVIDED PER UBC REQUIREMENTS TO PROVIDE A HABITABLE ENVIRONMENT.

(3) INDOOR ENVIRONMENT EXCLUDING BATHROOMS, TOILETS, CLOSETS AND CORRIDORS.

(4) OUTDOOR ENVIRONMENT LIMITED TO REAR YARD OF SINGLE FAMILY HOMES, MULTIFAMILY PATIOS AND BALCONIES (WITH A DEPTH OF 6' OR MORE) AND COMMON RECREATION AREAS.

(5) OUTDOOR ENVIRONMENT LIMITED TO PLAYGROUND AREAS, PICNIC AREAS, AND OTHER AREAS OF FREQUENT HUMAN USE.

(6) RELIGIOUS INSTITUTIONS (CHURCHES, TEMPLES, AND OTHER PLACES OF WORSHIP) OF A SMALL SIZE (OCCUPANCY) OF 100 PERSONS OR LESS) MAY OCCUPY EXISTING BUILDINGS WITHIN AREAS OF EXTERIOR NOISE LEVELS RANGING FROM 65 TO 75 DB CNEL WITHOUT PROVIDING ADDITIONAL NOISE INSULATION FOR THE BUILDING.

SOURCE: CITY OF LAKE FOREST, JULY 11, 1995.

TABLE 3.11-8: LAKE FOREST SAFETY AND NOISE ELEMENT TABLE SN-3: NOISE/LAND USE COMPATIBILITY MATRIX

	COMMUNITY NOISE EQUIVALENT LEVEL CNEL						
LAND USE CATEGORY	55		60	65	70	75	80
Residential – Single-Family, Multi-family, Duplex	A	A	B	C	C		
Residential – Mobile Homes	A	A	B	C	C		
Transient Lodging – Motels, Hotels	A	A	B	B	C	C	
Schools, Libraries, Churches, Hospitals, Nursing/Convalescent Homes, Preschools, Day Care Centers (1)[2]	A	A	B	C	C		
Auditoriums, Concert Halls, Amphitheaters, Meeting Halls	B	B	C	C			
Sports Areas, Outdoor Spectator Sports, Amusement Parks	A	A	A	B	B		
Playgrounds, Neighborhood Parks	A	A	A	B	C		
Golf Courses, Riding Stables, Cemeteries	A	A	A	A	B	C	C
Office and Professional Buildings	A	A	A	B	B	C	
Commercial Retail, Banks, Restaurants, Theaters	A	A	A	A	B	B	C
Industrial, Manufacturing, Utilities, Wholesale, Service Stations	A	A	A	A	B	B	B
Agriculture	A	A	A	A	A	A	A

NOTES:

ZONE A. NORMALLY ACCEPTABLE—SPECIFIED LAND USE IS SATISFACTORY, BASED ON THE ASSUMPTION THAT ANY BUILDINGS INVOLVED ARE OF NORMAL CONVENTIONAL CONSTRUCTION WITHOUT ANY SPECIAL NOISE INSULATION REQUIREMENTS.

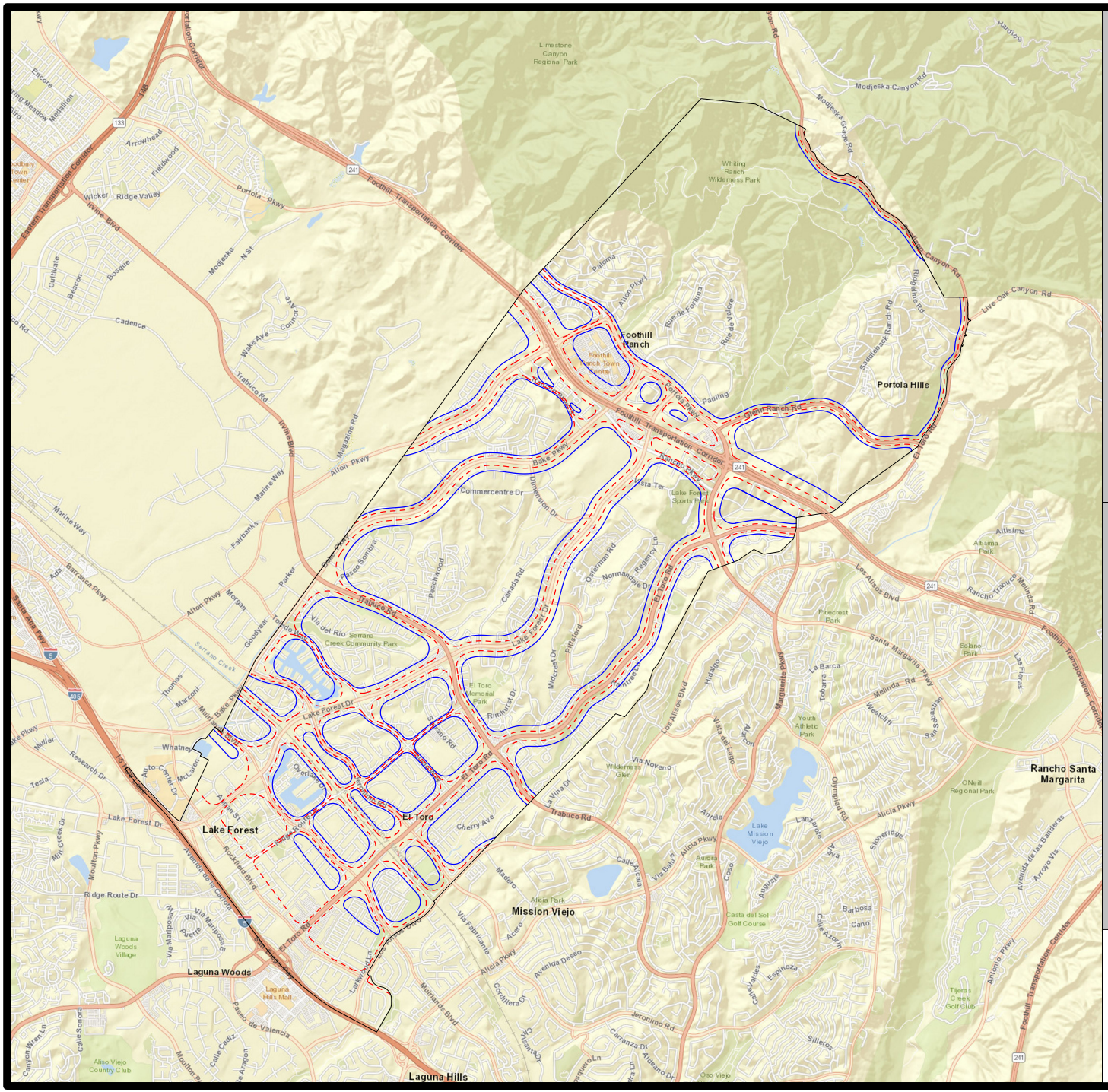
ZONE B. CONDITIONALLY ACCEPTABLE—NEW CONSTRUCTION OR DEVELOPMENT SHOULD BE UNDERTAKEN ONLY AFTER DETAILED ANALYSIS OF NOISE REDUCTION REQUIREMENT IS MADE AND NEEDED NOISE INSULATION FEATURES IN THE DESIGN ARE DETERMINED. CONVENTIONAL CONSTRUCTION, WITH CLOSED WINDOWS AND FRESH AIR SUPPLY SYSTEMS OR AIR-CONDITIONING, WILL NORMALLY SUFFICE.

ZONE C. NORMALLY UNACCEPTABLE—NEW CONSTRUCTION OR DEVELOPMENT SHOULD GENERALLY BE DISCOURAGED. IF NEW CONSTRUCTION OR DEVELOPMENT DOES PROCEED, A DETAILED ANALYSIS OF NOISE REDUCTION REQUIREMENTS MUST BE MADE AND NEEDED NOISE INSULATION FEATURES INCLUDED IN THE DESIGN.

(1) Religious institutions (Churches, synagogues, temples and other places of worship) of a small size (occupancy of 100 persons or less) may occupy existing buildings within areas of exterior noise levels ranging from 65 to 75 dB CNEL without providing additional noise insulation for the building.

(2) Shaded areas indicate new construction or development should generally not be undertaken.

Source: City of Lake Forest, July 11, 1995.



Lake Forest General Plan Update

City of Lake Forest, California

Figure 3.11-1: Existing Noise Contours

Legend

- Lake Forest City Boundary
- 60 dBA CNEL
- 65 dBA CNEL

Note: Noise contours do not account for existing sound walls or building coverage and are intended to represent maximum noise exposure assuming line-of-site to the noise source. These contours are intended for screening purposes only. Site-specific noise studies should be done for projects which my be located within a high noise contour region.

0 ft 3000 ft 6000 ft 9000 ft

Projection: State Plane (California Zone 6) / NAD83 / feet
Rev. Date: 05/31/2018

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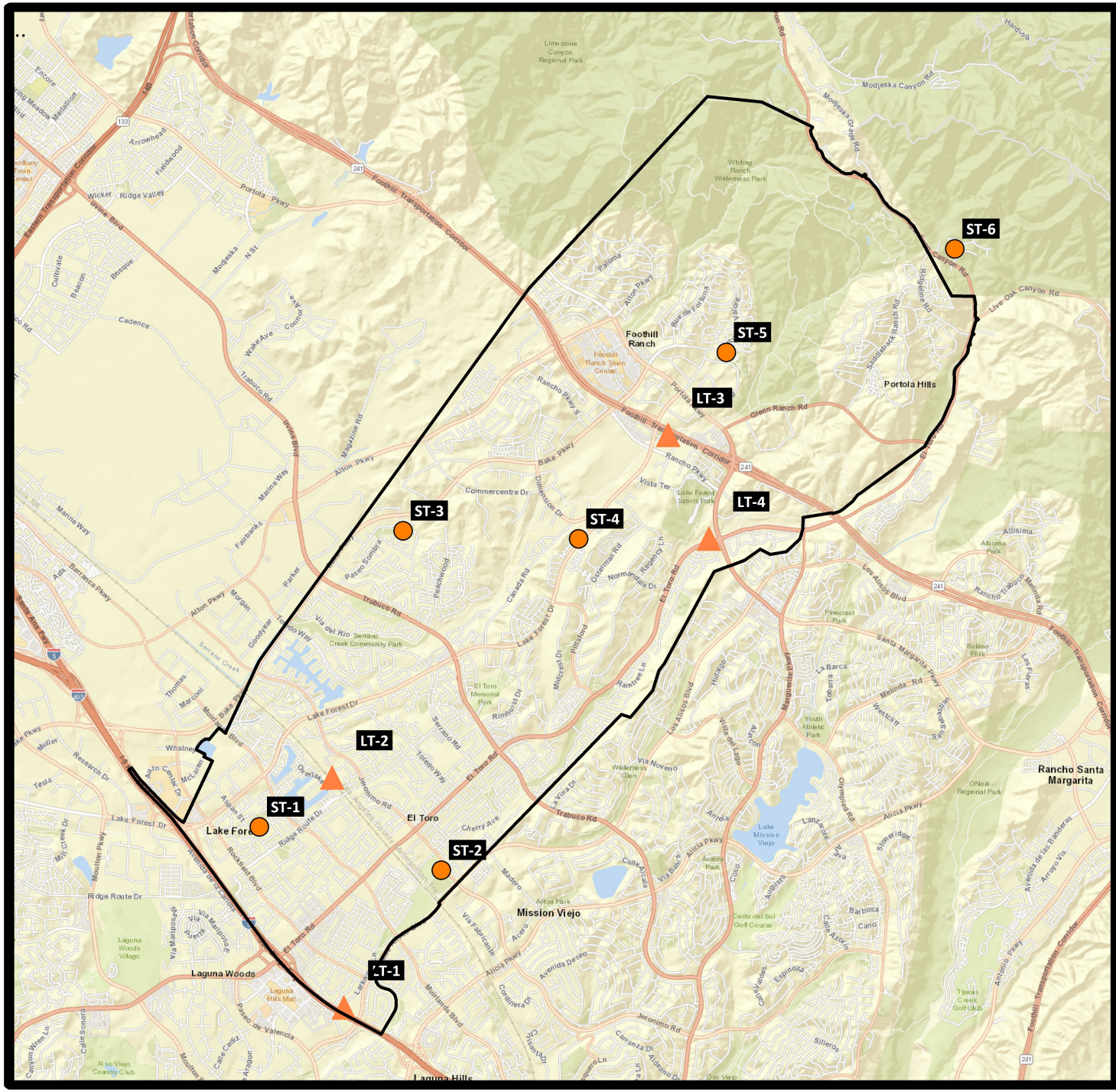

Lake Forest General Plan Update

City of Lake Forest, California

Figure 3.11-2: Noise Measurement Sites

Legend

- Lake Forest City Boundary
- Noise Measurement - Long Term
- Noise Measurement - Short Term

0 ft 3000 ft 6000 ft 9000 ft

Projection: State Plane (California Zone 6) / NAD83 / feet
Rev. Date: 05/31/2018

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END BACKGROUND SECTION

Appendix A: Acoustical Terminology

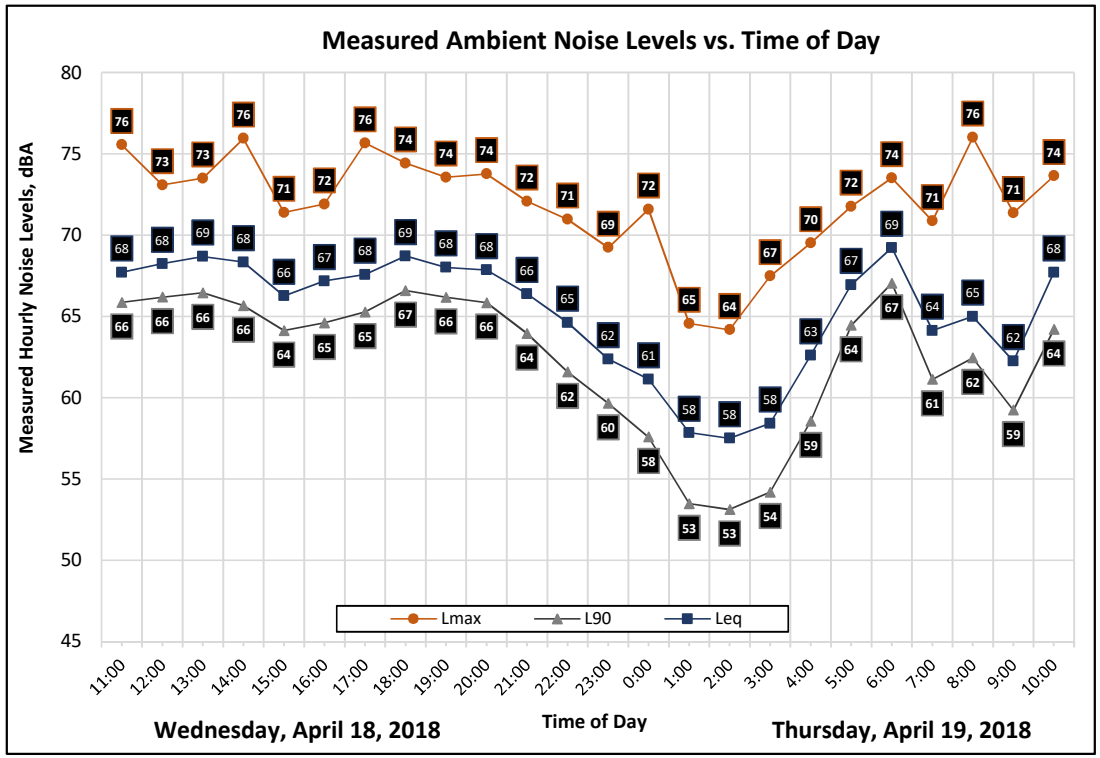
Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
ASTC	Apparent Sound Transmission Class. Similar to STC but includes sound from flanking paths and correct for room reverberation. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by +5 dBA and nighttime hours weighted by +10 dBA.
DNL	See definition of Ldn.
IIC	Impact Insulation Class. An integer-number rating of how well a building floor attenuates impact sounds, such as footsteps. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
L(n)	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L50 is the sound level exceeded 50% of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
NIC	Noise Isolation Class. A rating of the noise reduction between two spaces. Similar to STC but includes sound from flanking paths and no correction for room reverberation.
NNIC	Normalized Noise Isolation Class. Similar to NIC but includes a correction for room reverberation.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
RT60	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is a rating, in decibels, of a discrete event, such as an aircraft flyover or train pass by, that compresses the total sound energy into a one-second event.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations. The STC rating is typically used to rate the sound transmission of a specific building element when tested in laboratory conditions where flanking paths around the assembly don't exist. A larger number means more attenuation. The scale, like the decibel scale for sound, is logarithmic.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B1 : Continuous Noise Monitoring Results

Site: LT-1
Project: Lake Forest General Plan Update
Location: 24621 Bridger Road, 220 feet to I5 CL
Coordinates: 33.609698, -117.699407
Meter: LDL 812-2
Calibrator: B&K 4230

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Wednesday, April 18, 2018	11:00	68	76	68	66
Wednesday, April 18, 2018	12:00	68	73	68	66
Wednesday, April 18, 2018	13:00	69	73	68	66
Wednesday, April 18, 2018	14:00	68	76	68	66
Wednesday, April 18, 2018	15:00	66	71	66	64
Wednesday, April 18, 2018	16:00	67	72	67	65
Wednesday, April 18, 2018	17:00	68	76	67	65
Wednesday, April 18, 2018	18:00	69	74	68	67
Wednesday, April 18, 2018	19:00	68	74	68	66
Wednesday, April 18, 2018	20:00	68	74	68	66
Wednesday, April 18, 2018	21:00	66	72	66	64
Wednesday, April 18, 2018	22:00	65	71	64	62
Wednesday, April 18, 2018	23:00	62	69	62	60
Thursday, April 19, 2018	0:00	61	72	61	58
Thursday, April 19, 2018	1:00	58	65	57	53
Thursday, April 19, 2018	2:00	58	64	57	53
Thursday, April 19, 2018	3:00	58	67	58	54
Thursday, April 19, 2018	4:00	63	70	62	59
Thursday, April 19, 2018	5:00	67	72	67	64
Thursday, April 19, 2018	6:00	69	74	69	67
Thursday, April 19, 2018	7:00	64	71	63	61
Thursday, April 19, 2018	8:00	65	76	65	62
Thursday, April 19, 2018	9:00	62	71	61	59
Thursday, April 19, 2018	10:00	68	74	66	64

Statistics	Leq	Lmax	L50	L90
Day Average	67	74	67	65
Night Average	64	69	62	59
Day Low	62	71	61	59
Day High	69	76	68	67
Night Low	58	64	57	53
Night High	69	74	69	67
Ldn	71	Day %		78
CNEL	72	Night %		22

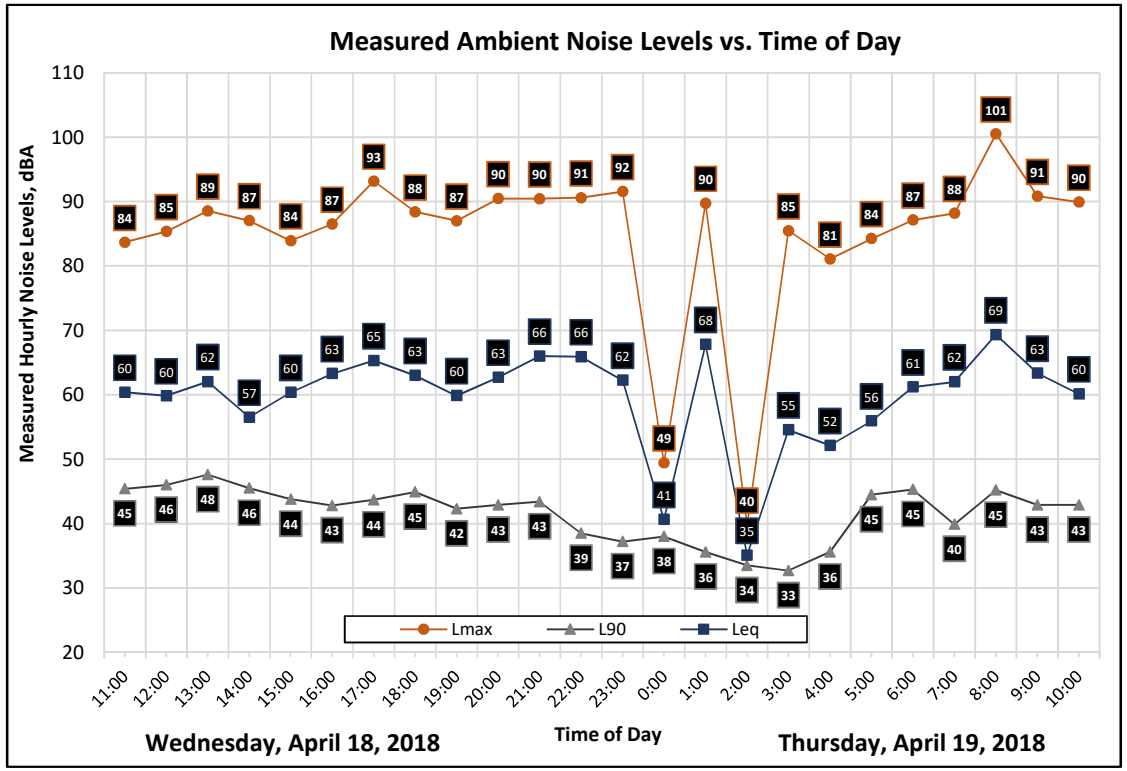


Appendix B2 : Continuous Noise Monitoring Results

Site: LT-2
Project: Lake Forest General Plan Update
Location: Near Shadowfax Dr. - 75' to RR
Coordinates: 33.633899, -117.701136
Meter: LDL 831-1
Calibrator: B&K 4230

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Wednesday, April 18, 2018	11:00	60	84	48	45
Wednesday, April 18, 2018	12:00	60	85	48	46
Wednesday, April 18, 2018	13:00	62	89	49	48
Wednesday, April 18, 2018	14:00	57	87	47	46
Wednesday, April 18, 2018	15:00	60	84	45	44
Wednesday, April 18, 2018	16:00	63	87	45	43
Wednesday, April 18, 2018	17:00	65	93	45	44
Wednesday, April 18, 2018	18:00	63	88	47	45
Wednesday, April 18, 2018	19:00	60	87	44	42
Wednesday, April 18, 2018	20:00	63	90	45	43
Wednesday, April 18, 2018	21:00	66	90	45	43
Wednesday, April 18, 2018	22:00	66	91	41	39
Wednesday, April 18, 2018	23:00	62	92	39	37
Thursday, April 19, 2018	0:00	41	49	40	38
Thursday, April 19, 2018	1:00	68	90	37	36
Thursday, April 19, 2018	2:00	35	40	35	34
Thursday, April 19, 2018	3:00	55	85	35	33
Thursday, April 19, 2018	4:00	52	81	40	36
Thursday, April 19, 2018	5:00	56	84	46	45
Thursday, April 19, 2018	6:00	61	87	47	45
Thursday, April 19, 2018	7:00	62	88	42	40
Thursday, April 19, 2018	8:00	69	101	48	45
Thursday, April 19, 2018	9:00	63	91	46	43
Thursday, April 19, 2018	10:00	60	90	47	43

Statistics	Leq	Lmax	L50	L90
Day Average	63	89	46	44
Night Average	62	78	40	38
Day Low	57	84	42	40
Day High	69	101	49	48
Night Low	35	40	35	33
Night High	68	92	47	45
Ldn	69	Day %		70
CNEL	69	Night %		30

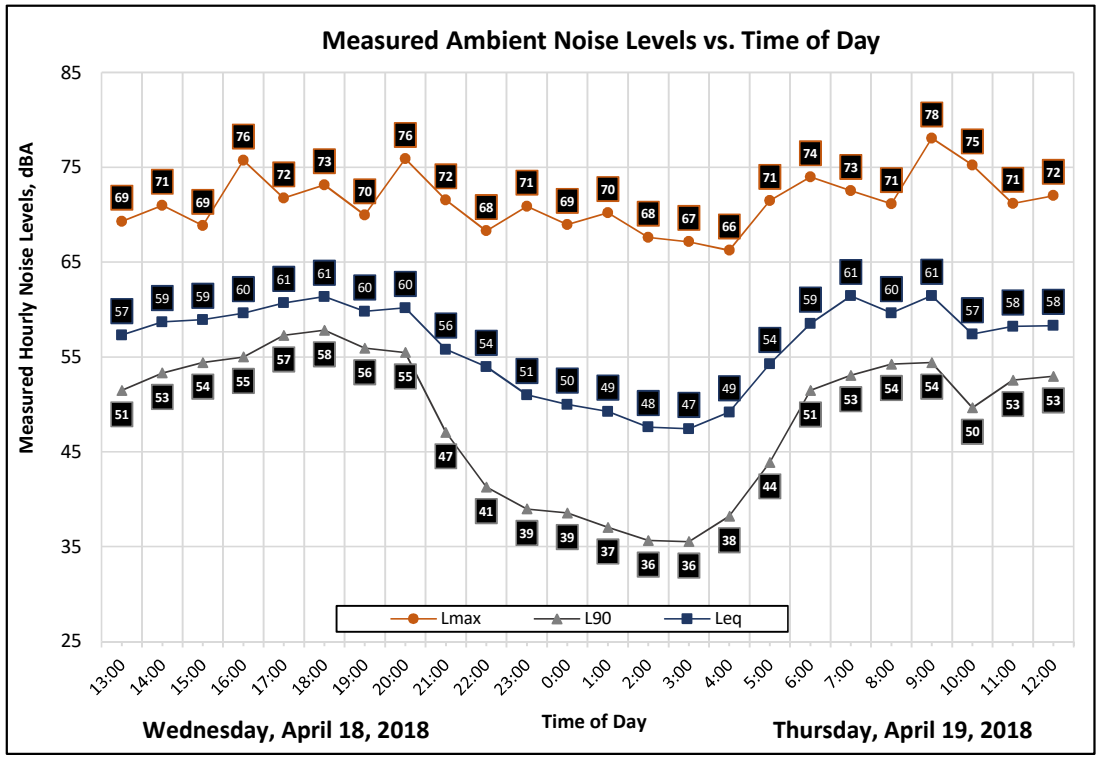


Appendix B3 : Continuous Noise Monitoring Results

Site: LT-3
Project: Lake Forest General Plan Update
Location: Skate Park of Etnies LF, 150' to CL Route 241
Coordinates: 33.670782, -117.659358
Meter: LDL 820-1
Calibrator: B&K 4230

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Wednesday, April 18, 2018	13:00	57	69	56	51
Wednesday, April 18, 2018	14:00	59	71	57	53
Wednesday, April 18, 2018	15:00	59	69	58	54
Wednesday, April 18, 2018	16:00	60	76	59	55
Wednesday, April 18, 2018	17:00	61	72	60	57
Wednesday, April 18, 2018	18:00	61	73	61	58
Wednesday, April 18, 2018	19:00	60	70	59	56
Wednesday, April 18, 2018	20:00	60	76	59	55
Wednesday, April 18, 2018	21:00	56	72	54	47
Wednesday, April 18, 2018	22:00	54	68	51	41
Wednesday, April 18, 2018	23:00	51	71	43	39
Thursday, April 19, 2018	0:00	50	69	42	39
Thursday, April 19, 2018	1:00	49	70	40	37
Thursday, April 19, 2018	2:00	48	68	37	36
Thursday, April 19, 2018	3:00	47	67	39	36
Thursday, April 19, 2018	4:00	49	66	43	38
Thursday, April 19, 2018	5:00	54	71	50	44
Thursday, April 19, 2018	6:00	59	74	56	51
Thursday, April 19, 2018	7:00	61	73	58	53
Thursday, April 19, 2018	8:00	60	71	59	54
Thursday, April 19, 2018	9:00	61	78	60	54
Thursday, April 19, 2018	10:00	57	75	55	50
Thursday, April 19, 2018	11:00	58	71	57	53
Thursday, April 19, 2018	12:00	58	72	57	53

Statistics	Leq	Lmax	L50	L90
Day Average	60	72	58	54
Night Average	53	69	45	40
Day Low	56	69	54	47
Day High	61	78	61	58
Night Low	47	66	37	36
Night High	59	74	56	51
Ldn	61	Day %		89
CNEL	62	Night %		11

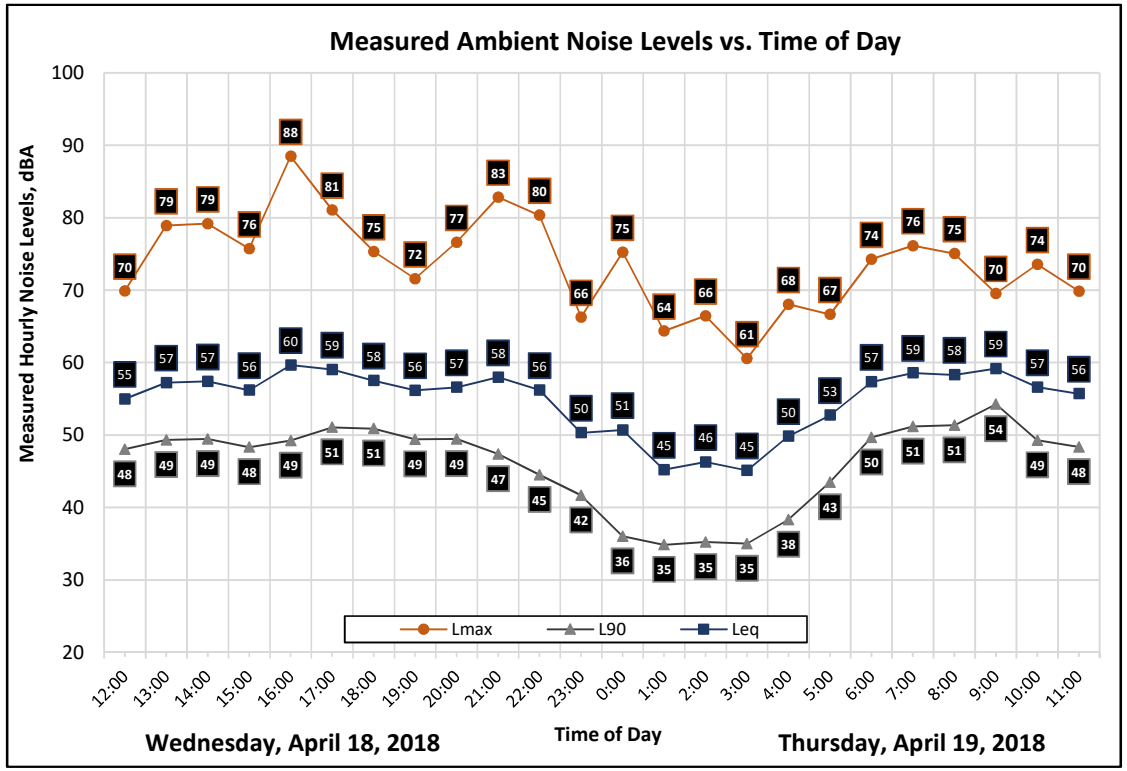


Appendix B4 : Continuous Noise Monitoring Results

Site: LT-4
Project: Lake Forest General Plan Update
Location: 350' South of Portola, 140' to CL of El Toro
Coordinates: 33.659882, -117.653935
Meter: LDL 812-1
Calibrator: B&K 4230

Date	Time	Measured Level, dBA			
		L_{eq}	L_{max}	L_{50}	L_{90}
Wednesday, April 18, 2018	12:00	55	70	53	48
Wednesday, April 18, 2018	13:00	57	79	53	49
Wednesday, April 18, 2018	14:00	57	79	54	49
Wednesday, April 18, 2018	15:00	56	76	54	48
Wednesday, April 18, 2018	16:00	60	88	54	49
Wednesday, April 18, 2018	17:00	59	81	56	51
Wednesday, April 18, 2018	18:00	58	75	55	51
Wednesday, April 18, 2018	19:00	56	72	54	49
Wednesday, April 18, 2018	20:00	57	77	54	49
Wednesday, April 18, 2018	21:00	58	83	53	47
Wednesday, April 18, 2018	22:00	56	80	50	45
Wednesday, April 18, 2018	23:00	50	66	47	42
Thursday, April 19, 2018	0:00	51	75	44	36
Thursday, April 19, 2018	1:00	45	64	39	35
Thursday, April 19, 2018	2:00	46	66	40	35
Thursday, April 19, 2018	3:00	45	61	40	35
Thursday, April 19, 2018	4:00	50	68	46	38
Thursday, April 19, 2018	5:00	53	67	50	43
Thursday, April 19, 2018	6:00	57	74	55	50
Thursday, April 19, 2018	7:00	59	76	56	51
Thursday, April 19, 2018	8:00	58	75	56	51
Thursday, April 19, 2018	9:00	59	70	58	54
Thursday, April 19, 2018	10:00	57	74	55	49
Thursday, April 19, 2018	11:00	56	70	54	48

Statistics	Leq	Lmax	L50	L90
Day Average	58	76	55	50
Night Average	52	69	46	40
Day Low	55	70	53	47
Day High	60	88	58	54
Night Low	45	61	39	35
Night High	57	80	55	50
Ldn	60	Day %		85
CNEL	61	Night %		15



Appendix B-5 : Short Term Noise Monitoring Results

Site: ST-1
Project: Lake Forest General Plan Update
Location: Mountain View Park
Coordinates: 33.628643, -117.710629

Meter: LDL 831-2
Calibrator: B&K 4230

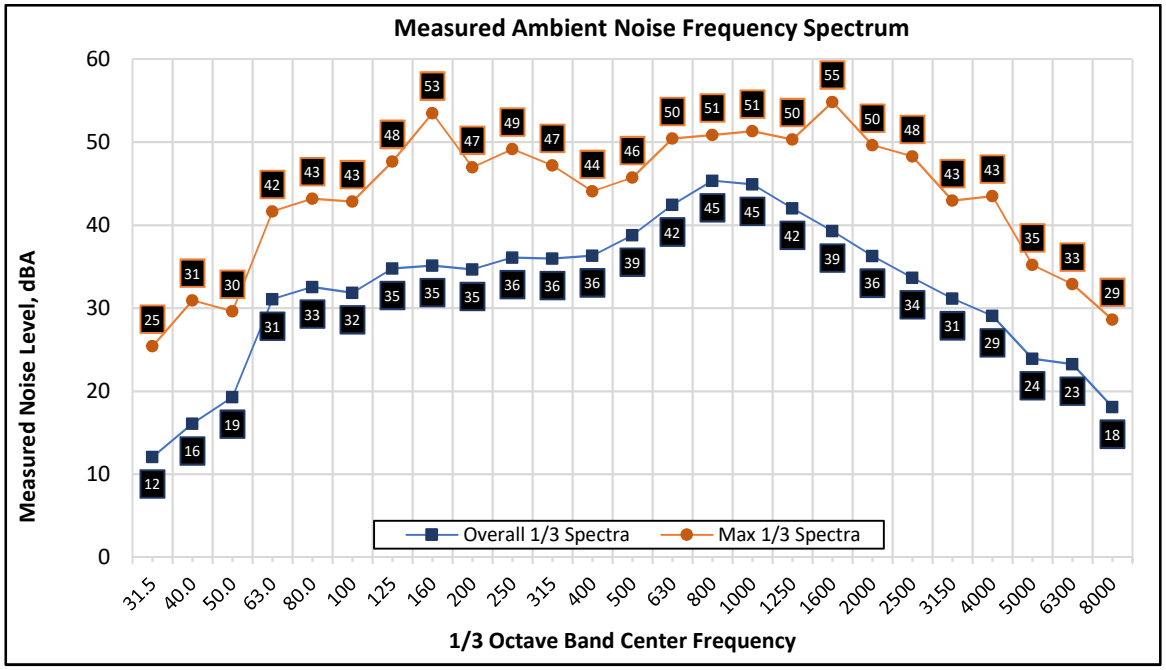
Start: 2018-04-18 16:36:39
Stop: 2018-04-18 16:46:39
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	52
L_{max}:	59
L_{min}:	47
L_{50}:	51
L_{90}:	49

Notes

Park noise. Kids playing. Local traffic. Single engine aircraft overflight. ~50-55 dBA.



Appendix B-6 : Short Term Noise Monitoring Results

Site: ST-1
Project: Lake Forest General Plan Update
Location: Mountain View Park
Coordinates: 33.628643, -117.710629

Meter: LDL 831-2
Calibrator: B&K 4230

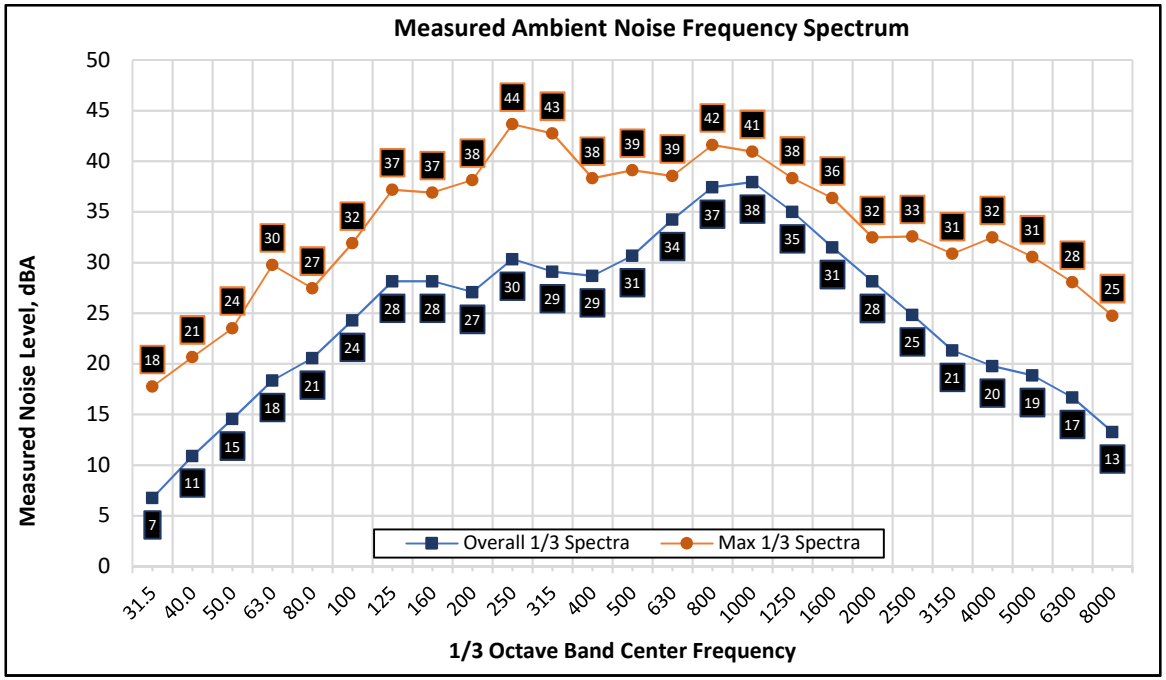
Start: 2018-04-18 23:47:58
Stop: 2018-04-18 23:57:58
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	44
L_{max}:	48
L_{min}:	41
L_{50}:	44
L_{90}:	43

Notes

Distant traffic. Jet overflight. HNL to ORD. Jets around 45-46 dBA. LAX to Miami.



Appendix B-7 : Short Term Noise Monitoring Results

Site: ST-2
Project: Lake Forest General Plan Update
Location: Heroes Park
Coordinates: 33.624244, -117.686886

Meter: LDL 831-2
Calibrator: B&K 4230

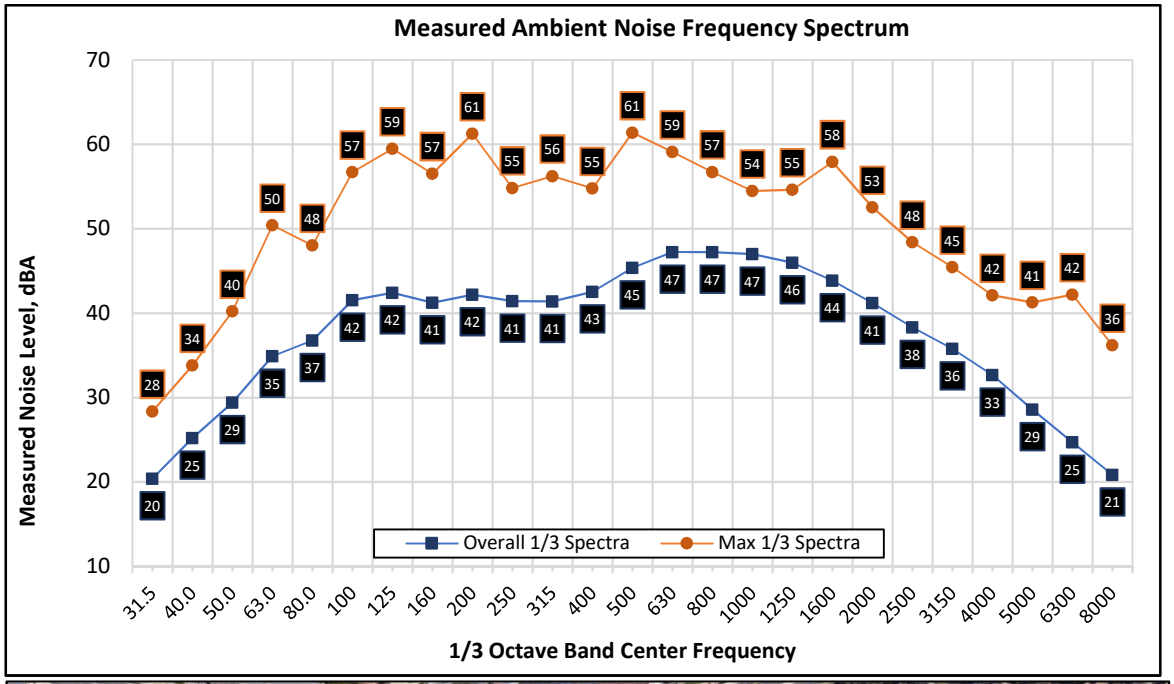
Start: 2018-04-18 17:07:48
Stop: 2018-04-18 17:17:48
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	56
L_{max}:	65
L_{min}:	49
L_{50}:	55
L_{90}:	52

Notes

Ball fields. Traffic. Driving range. Ball "whacks." Single engine aircraft. Pass anger train. Amtrak x2



Appendix B-8 : Short Term Noise Monitoring Results

Site: ST-2
Project: Lake Forest General Plan Update
Location: Heroes Park
Coordinates: 33.624244, -117.686886

Meter: LDL 831-2
Calibrator: B&K 4230

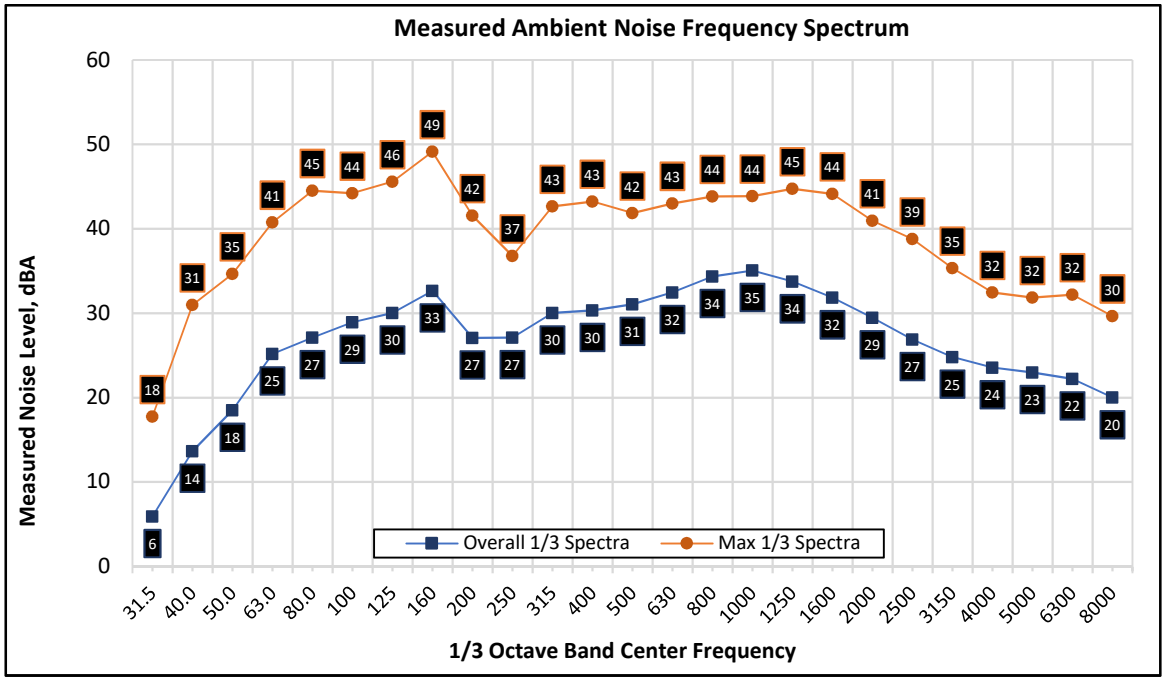
Start: 2018-04-19 00:07:19
Stop: 2018-04-19 00:17:19
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	44
L_{max}:	52
L_{min}:	38
L_{50}:	42
L_{90}:	40

Notes

Traffic. Jet. LAX to ORD. Sprinklers at park.



Appendix B-9 : Short Term Noise Monitoring Results

Site: ST-3
Project: Lake Forest General Plan Update
Location: Rancho Serrano Park
Coordinates: 33.660253, -117.692514

Meter: LDL 831-2
Calibrator: B&K 4230

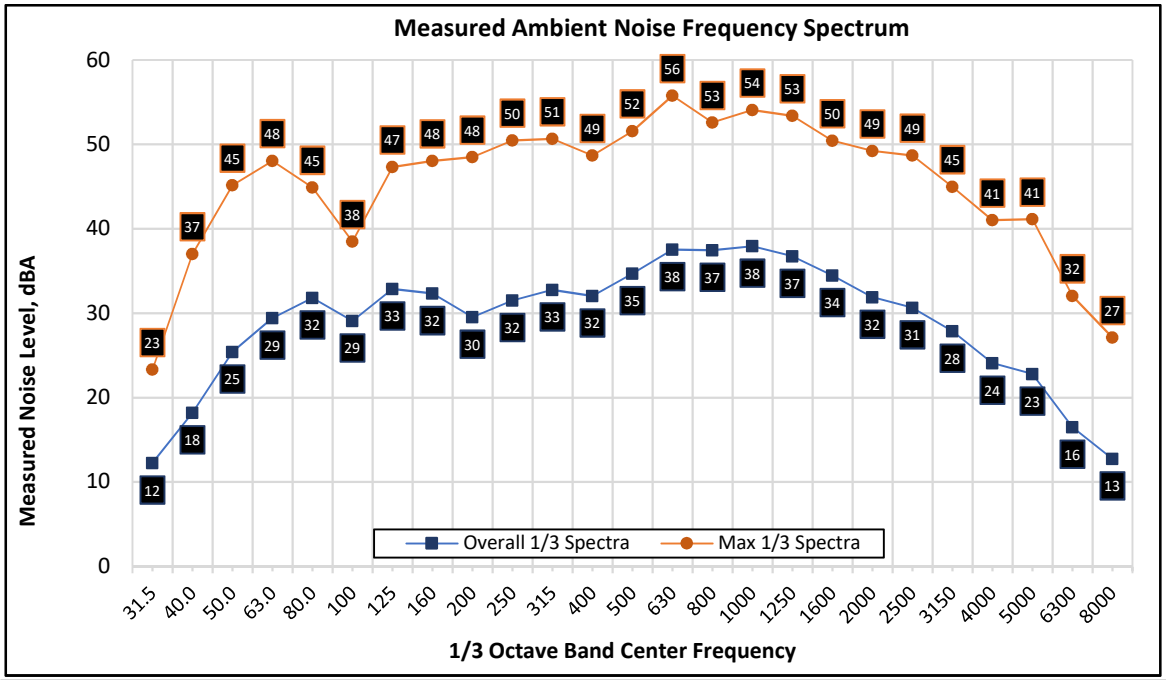
Start: 2018-04-18 15:52:15
Stop: 2018-04-18 16:02:15
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	47
L_{max}:	63
L_{min}:	40
L_{50}:	44
L_{90}:	42

Notes

Traffic noise from Bake Pkwy. Single engine airplane overflights. High flying jet. LAX to Atlanta.



Appendix B-10 : Short Term Noise Monitoring Results

Site: ST-3
Project: Lake Forest General Plan Update
Location: Rancho Serrano Park
Coordinates: 33.660253, -117.692514

Meter: LDL 831-2
Calibrator: B&K 4230

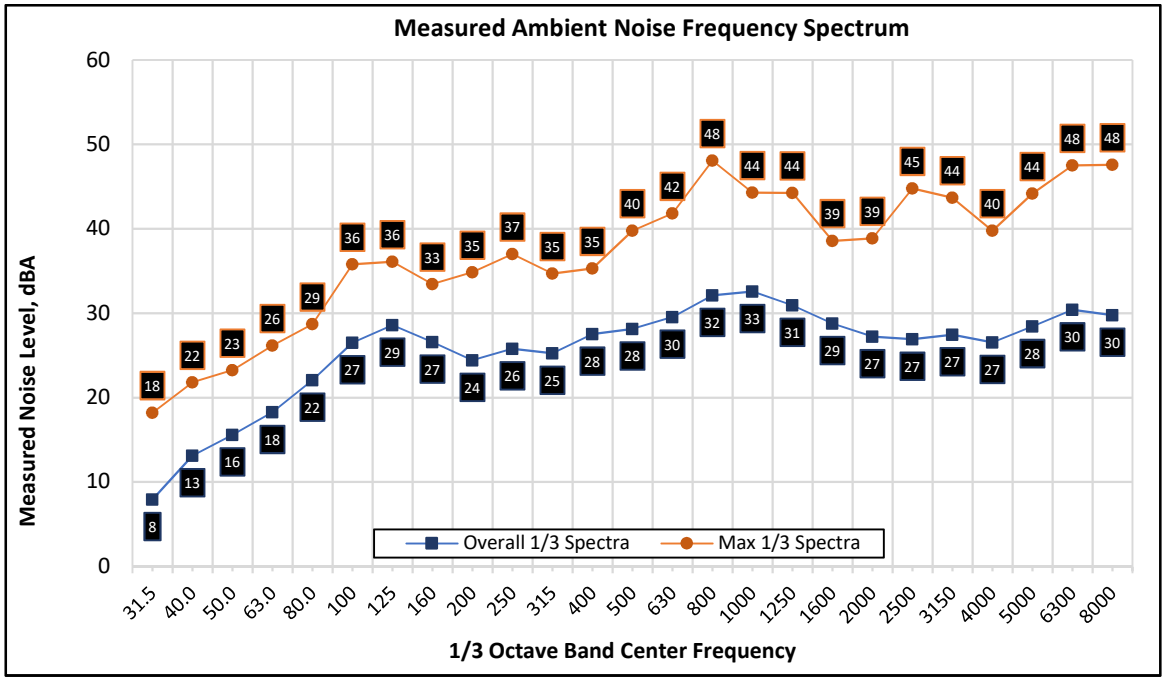
Start: 2018-04-18 23:27:05
Stop: 2018-04-18 23:37:05
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	42
L_{max}:	53
L_{min}:	36
L_{50}:	40
L_{90}:	38

Notes

Distant traffic. Sprinklers 37 dBA. Jets ~42 dBA. LAX to NYC. LAX to Washington IAD. LAX to Boston. LAX to Toronto.



Appendix B-11 : Short Term Noise Monitoring Results

Site: ST-4
Project: Lake Forest General Plan Update
Location: Autumn Glenn & Lake Forest - 120' to CL of LF
Coordinates: 33.659587, -117.670301

Meter: LDL 831-2
Calibrator: B&K 4230

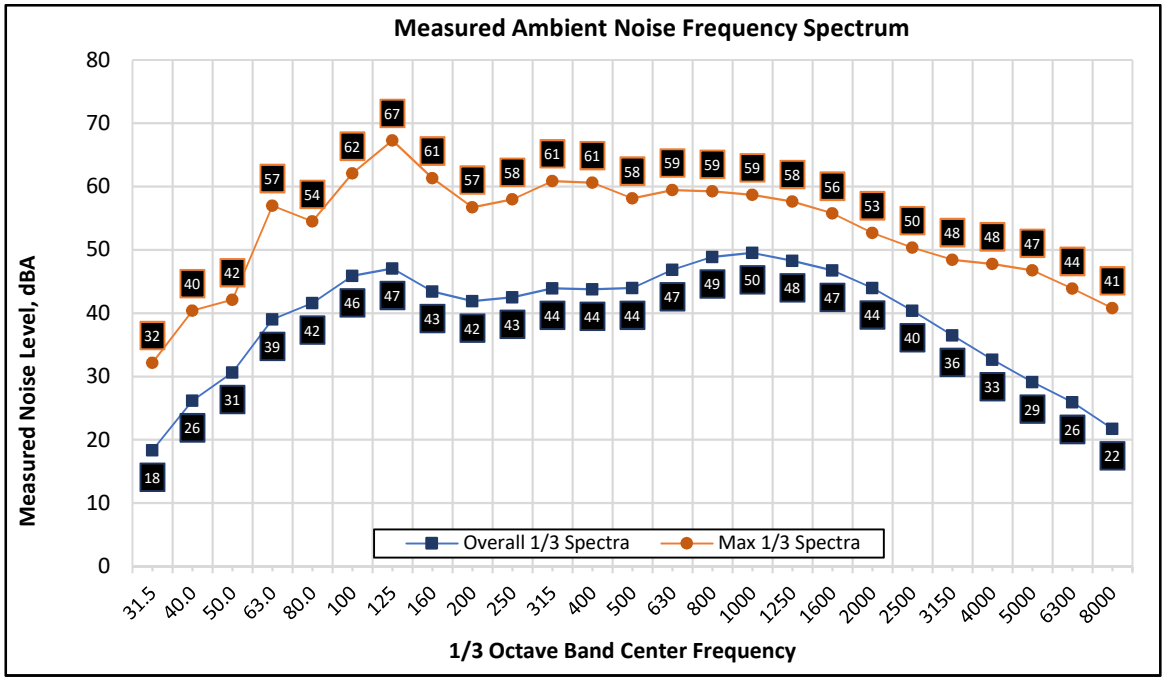
Start: 2018-04-18 15:31:09
Stop: 2018-04-18 15:41:09
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	58
L_{max}:	71
L_{min}:	43
L_{50}:	56
L_{90}:	48

Notes

Traffic on Forest Lake dominant. 6' wall at play area. Site of meter not fully shielded.



Appendix B-12 : Short Term Noise Monitoring Results

Site: ST-4
Project: Lake Forest General Plan Update
Location: Autumn Glenn & Lake Forest - 120' to CL of LF
Coordinates: 33.659587, -117.670301

Meter: LDL 831-2
Calibrator: B&K 4230

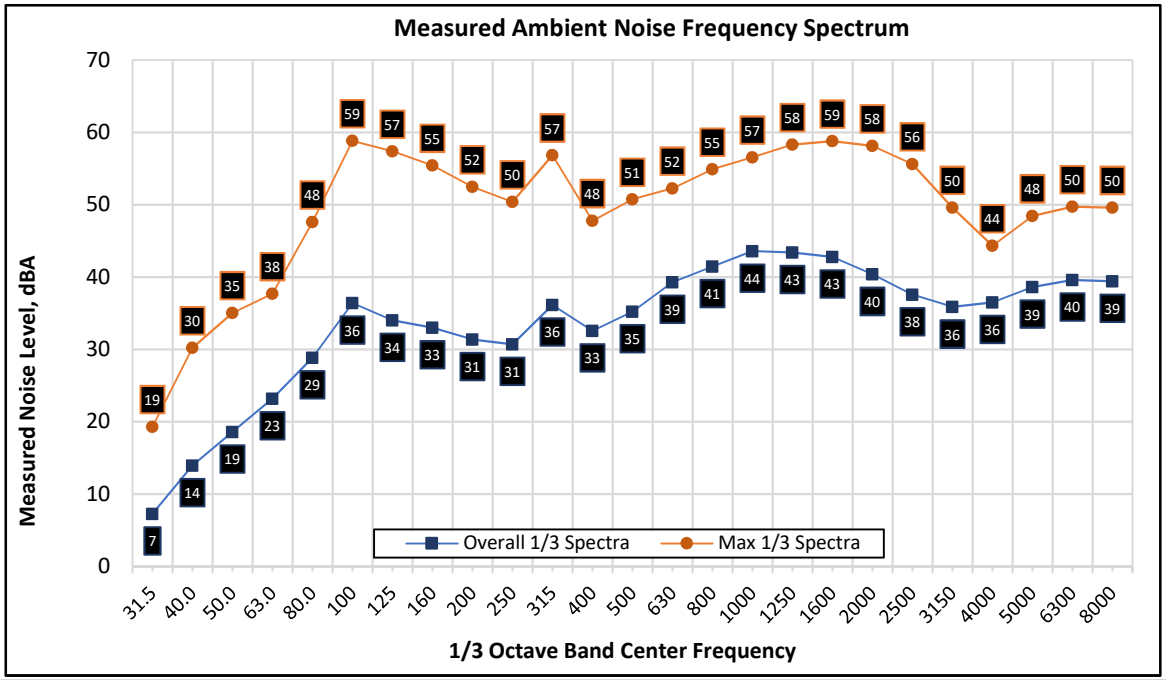
Start: 2018-04-18 23:01:56
Stop: 2018-04-18 23:11:56
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	52
L_{max}:	65
L_{min}:	42
L_{50}:	49
L_{90}:	44

Notes

Sprinklers 43-47 dBA. Traffic. Jet overflight. LAX to NC



Appendix B-13 : Short Term Noise Monitoring Results

Site: ST-5
Project: Lake Forest General Plan Update
Location: Foothill Ranch Community Park
Coordinates: 33.679642, -117.652032

Meter: LDL 831-2
Calibrator: B&K 4230

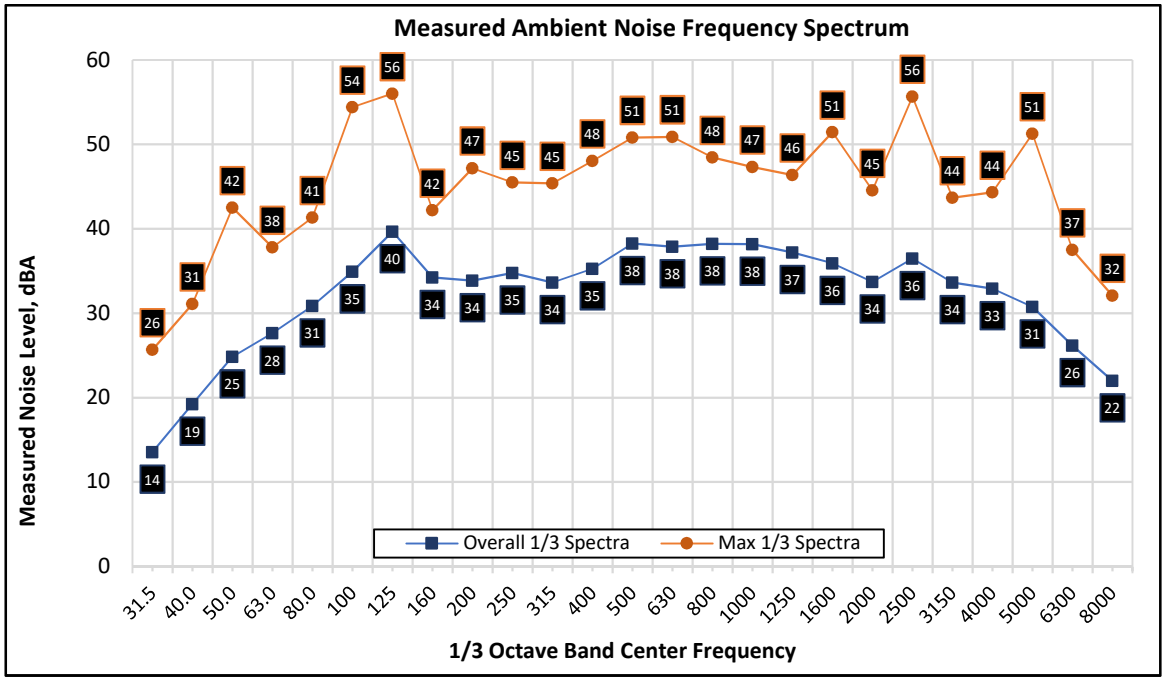
Start: 2018-04-18 14:01:58
Stop: 2018-04-18 14:11:58
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	49
L_{max}:	58
L_{min}:	42
L_{50}:	47
L_{90}:	44

Notes

Light breeze. Birds. Helicopter flyover to south. No kids at play equipment. Local traffic. Skater at hockey rink.



Appendix B-14 : Short Term Noise Monitoring Results

Site: ST-5
Project: Lake Forest General Plan Update
Location: Foothill Ranch Community Park
Coordinates: 33.679642, -117.652032

Meter: LDL 831-2
Calibrator: B&K 4230

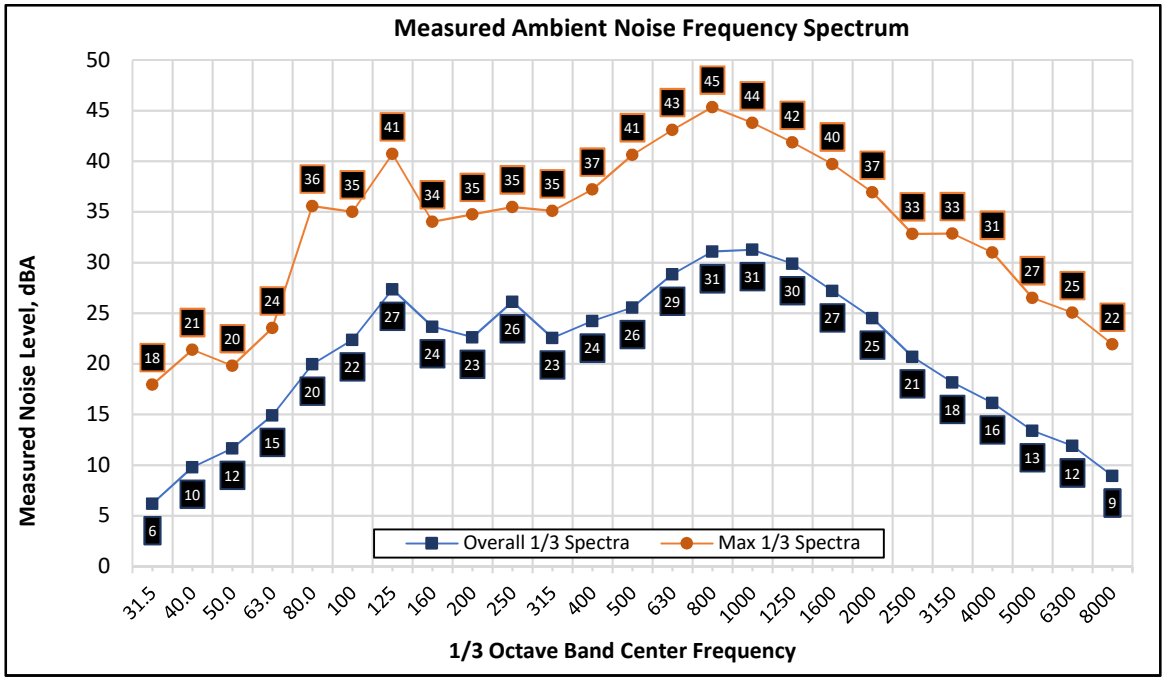
Start: 2018-04-18 22:41:15
Stop: 2018-04-18 22:51:15
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	39
L_{max}:	51
L_{min}:	34
L_{50}:	37
L_{90}:	35

Notes

Distant and local traffic.



Appendix B-15 : Short Term Noise Monitoring Results

Site: ST-6
Project: Lake Forest General Plan Update
Location: Santiago Canyon Park
Coordinates: 33.690830, -117.623216

Meter: LDL 831-2
Calibrator: B&K 4230

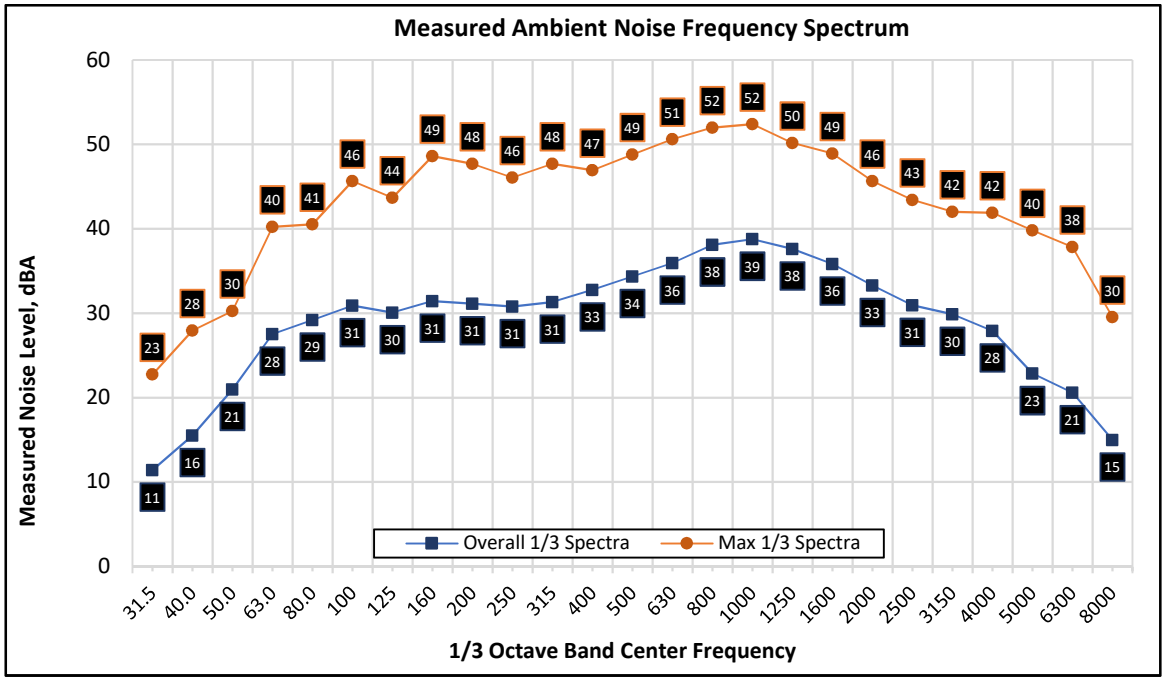
Start: 2018-04-18 14:52:22
Stop: 2018-04-18 15:02:22
SLM: 831-2
Serial: 1800

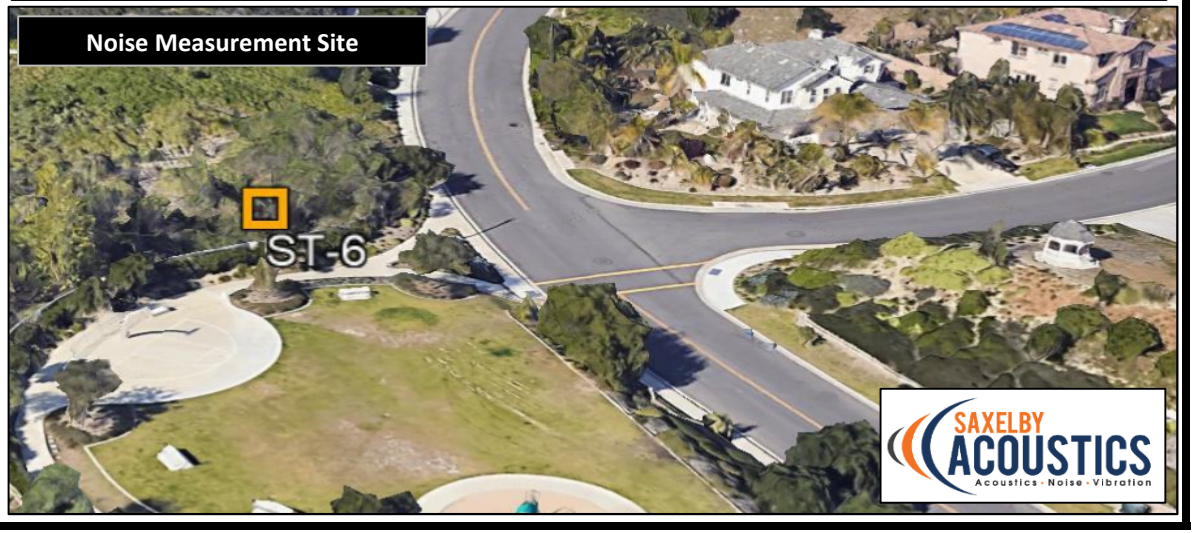
Measurement Results, dBA

Duration:	0:10
L_{eq}:	47
L_{max}:	59
L_{min}:	37
L_{50}:	43
L_{90}:	41

Notes

Distant and local traffic.





Appendix B-16 : Short Term Noise Monitoring Results

Site: ST-6
Project: Lake Forest General Plan Update
Location:
Coordinates:

Meter: LDL 831-2
Calibrator: B&K 4230

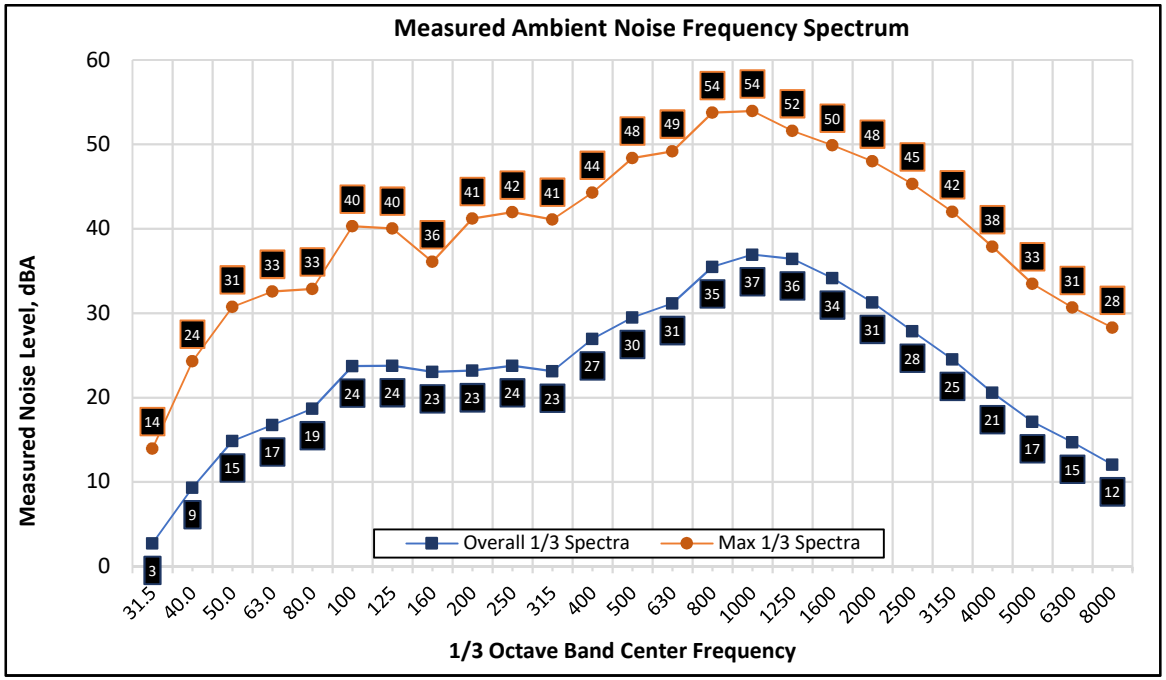
Start: 2018-04-18 22:16:16
Stop: 2018-04-18 22:26:16
SLM: 831-2
Serial: 1800

Measurement Results, dBA

Duration:	0:10
L_{eq}:	43
L_{max}:	60
L_{min}:	24
L_{50}:	38
L_{90}:	28

Notes

Distant and local traffic.



Appendix C-1
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 180206
Description: Lake Forest GPU - Existing Traffic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
1	Trabuco w/o Lake Forest	21,535	73	16	11	2.8%	0.3%	50	100	-5	288	134	62	61.9
2	Trabuco w/o Ridge Route	22,336	73	16	11	2.8%	0.3%	50	75	-5	295	137	64	63.9
3	Trabuco w/o El Toro	25,107	73	16	11	2.8%	0.3%	50	75	-5	319	148	69	64.4
4	Trabuco e/o El Toro	21,730	73	16	11	3.8%	0.3%	45	100	-5	250	116	54	61.0
5	Toledo w/o Lake Forest	6,063	73	16	11	3.0%	0.3%	50	100	-5	125	58	27	56.4
6	Toledo e/o Lake Forest	5,812	73	16	11	3.0%	0.3%	50	50	-5	121	56	26	60.8
7	Toledo e/o Ridge Route	5,985	73	16	11	3.0%	0.3%	45	50	-5	103	48	22	59.7
8	Jeronimo w/o Lake Forest	13,482	73	16	11	3.0%	0.3%	45	50	-5	177	82	38	63.2
9	Jeronimo w/o Ridge Route	13,349	73	16	11	3.0%	0.3%	40	60	-5	144	67	31	60.7
10	Jeronimo w/o El Toro	14,359	73	16	11	3.0%	0.3%	40	50	-5	151	70	33	62.2
11	Jeronimo e/o El Toro	21,648	73	16	11	3.0%	0.3%	40	50	-5	198	92	43	64.0
12	Muirlands w/o Lake Forest	13,936	73	16	11	3.0%	0.3%	45	65	-5	181	84	39	61.7
13	Muirlands w/o Ridge Route	17,180	73	16	11	3.0%	0.3%	45	60	-5	208	96	45	63.1
14	Muirlands e/o Ridge Route	19,578	73	16	11	3.0%	0.3%	45	75	-5	227	105	49	62.2
15	Muirlands e/o El Toro	20,709	73	16	11	3.0%	0.3%	45	55	-5	235	109	51	64.5
16	Rockfield w/o Lake Forest	21,911	73	16	11	5.2%	0.2%	45	100		257	119	55	66.2
17	Rockfield w/o Ridge Route	17,549	73	16	11	5.2%	0.2%	45	50		222	103	48	69.7
18	Rockfield w/o El Toro	18,642	73	16	11	5.2%	0.2%	45	65	-5	231	107	50	63.3
19	Rockfield w/o Los Alisos	13,707	73	16	11	5.2%	0.2%	40	65	-5	155	72	33	60.7
20	Portola w/o Alton Pkwy	5,976	73	16	11	4.0%	0.5%	55	100	-5	151	70	32	57.7
21	Portola w/o Bake	17,526	73	16	11	4.0%	0.5%	45	120	-5	220	102	47	59.0
22	Portola w/o Lake Forest	23,677	73	16	11	4.0%	0.5%	45	115	-5	269	125	58	60.5
23	Portola w/o Glenn Ranch	32,283	73	16	11	4.0%	0.5%	45	120		331	153	71	66.6
24	Portola n/o SR-241	25,325	73	16	11	4.0%	0.5%	45	260		281	131	61	60.5
25	Portola s/o SR-241	27,477	73	16	11	4.0%	0.5%	45	120	-5	297	138	64	60.9

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Appendix C-2
FHWA-RD-77-108 Highway Traffic Noise Prediction Model
Data Input Sheet

Project #: 180206
Description: Lake Forest GPU - Existing Traffic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Segment	ADT	Day %	Eve %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
26	Portola w/o El Toro	35,739	73	16	11	3.0%	0.3%	50	390	-5	406	189	88	55.3
27	Portola e/o El Toro	37,996	73	16	11	3.0%	0.3%	50	160	-5	423	196	91	61.3
28	Rancho South w/o Bake	7,400	73	16	11	3.0%	0.3%	40	100		97	45	21	59.8
29	Rancho e/o Bake	13,914	73	16	11	3.0%	0.3%	45	100		181	84	39	63.9
30	Rancho e/o Lake Forest	19,440	73	16	11	3.0%	0.3%	45	90	-5	226	105	49	61.0
31	Glenn n/o Portola to s/o Saddleback Ranch Road	16,076	73	16	11	3.0%	0.3%	50	115	-5	239	111	51	59.8
32	Glenn Ranch w/o El Toro n/o Saddleback Ranch Road	6,849	73	16	11	3.0%	0.3%	50	115	-5	135	63	29	56.0
33	Alton s/o Portola	13,231	73	16	11	8.1%	0.7%	35	100	-5	143	66	31	57.3
34	Alton s/o SR-241	19,122	73	16	11	8.1%	0.7%	50	110		311	144	67	66.8
35	Alton s/o Rancho South	23,261	73	16	11	8.1%	0.7%	55	120		411	191	89	68.0
36	Alton n/o Trabuco	24,382	73	16	11	8.1%	0.7%	60	110	-5	488	226	105	64.7
37	Bake s/o Towne Centre Drive	26,318	73	16	11	4.9%	0.5%	50	85		352	164	76	69.3
38	Bake n/o Commercentre	29,630	73	16	11	4.9%	0.5%	50	100	-5	381	177	82	63.7
39	Bake s/o Commercentre	32,335	73	16	11	4.9%	0.5%	50	100	-5	404	188	87	64.1
40	Bake s/o Trabuco	46,162	73	16	11	3.3%	0.6%	50	85	-5	499	232	107	66.5
41	Bake s/o Toledo	49,268	73	16	11	3.3%	0.6%	50	140	-5	521	242	112	63.6
42	Lake Forest s/o Portola	9,502	73	16	11	6.6%	0.2%	50	100		183	85	39	63.9
43	Lake Forest n/o Rancho	18,493	73	16	11	6.6%	0.2%	50	100		285	132	61	66.8
44	Lake Forest s/o Rancho	20,894	73	16	11	6.6%	0.2%	50	125		309	143	67	65.9
45	Lake Forest n/o Trabuco	31,667	73	16	11	6.6%	0.2%	50	80	-5	408	189	88	65.6
46	Lake Forest s/o Trabuco	31,178	73	16	11	5.0%	0.0%	50	75	-5	383	178	83	65.6
47	Lake Forest n/o Jeronimo	33,027	73	16	11	5.0%	0.0%	50	75	-5	398	185	86	65.9
48	Lake Forest n/o Muirlands	32,627	73	16	11	5.0%	0.0%	50	80	-5	395	183	85	65.4
49	Lake Forest s/o Muirlands	36,011	73	16	11	3.3%	0.0%	40	75	-5	273	127	59	63.4
50	Lake Forest s/o Rockfield	59,276	73	16	11	3.3%	0.0%	40	100		381	177	82	68.7

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Appendix C-3

FHWA-RD-77-108 Highway Traffic Noise Prediction Model

Data Input Sheet

Project #: 180206
Description: Lake Forest GPU - Existing Traffic
Ldn/CNEL: CNEL
Hard/Soft: Soft

Segment	Roadway Segment	ADT	Day %	Eve. %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance	Offset (dB)	Contours (ft.) - No Offset 60 dBA	65 dBA	70 dBA	Level, dBA
51	Ridge Route n/o Toledo	6,666	73	16	11	3.0%	0.3%	40	55	-5	90	42	19	58.2
52	Ridge Route n/o Jeronimo	7,428	73	16	11	3.0%	0.3%	40	55	-5	97	45	21	58.7
53	Ridge Route s/o Jeronimo	7,689	73	16	11	3.0%	0.3%	40	75		100	46	21	61.8
54	Ridge Route n/o Muirlands	6,886	73	16	11	3.0%	0.3%	40	75	-5	92	43	20	56.4
55	Ridge Route n/o Rockfield	6,811	73	16	11	3.0%	0.3%	40	60	-5	92	43	20	57.8
56	Ridge Route s/o Rockfield	2,524	73	16	11	3.0%	0.3%	40	60	-5	47	22	10	53.5
57	El Toro n/o Glenn Ranch	13,969	73	16	11	5.9%	0.2%	50	180		233	108	50	61.7
58	El Toro s/o Glenn Ranch	14,800	73	16	11	5.9%	0.2%	55	200		284	132	61	62.3
59	El Toro n/o Sta Margarita	13,832	73	16	11	5.9%	0.2%	55	170		271	126	58	63.0
60	El Toro s/o Sta Margarita	25,322	73	16	11	5.9%	0.2%	55	90	-5	406	188	87	64.8
61	El Toro n/o Trabuco	31,358	73	16	11	5.9%	0.2%	50	110		399	185	86	68.4
62	El Toro s/o Trabuco	35,784	73	16	11	5.9%	0.2%	50	80	-5	436	202	94	66.0
63	El Toro n/o Jeronimo	38,539	73	16	11	3.0%	0.6%	50	65		437	203	94	72.4
64	El Toro n/o Muirlands	40,733	73	16	11	3.0%	0.6%	50	90		453	210	98	70.5
65	El Toro s/o Muirlands	44,716	73	16	11	2.7%	0.1%	40	75	-5	309	143	67	64.2
66	El Toro s/o Rockfield	54,028	73	16	11	2.7%	0.1%	40	100		350	163	75	68.2
67	Los Alisos n/o Jeronimo	28,974	73	16	11	3.0%	0.3%	45	75	-5	294	137	63	63.9
68	Los Alisos n/o Muirlands	30,001	73	16	11	3.0%	0.3%	45	80	-5	301	140	65	63.6
69	Los Alisos s/o Muirlands	27,284	73	16	11	3.0%	0.3%	45	70	-5	283	131	61	64.1
70	Los Alisos s/o Rockfield	25,047	73	16	11	3.0%	0.3%	45	50	-5	267	124	58	65.9
71	Commercentre e/o Alton	7,546	73	16	11	6.2%	1.9%	50	55		173	80	37	67.5
81	Dimension n/o Commercentre	5,963	73	16	11	3.8%	0.6%	45	100		108	50	23	60.5
82	Dimension s/o Commercentre	12,021	73	16	11	3.2%	0.4%	45	100		167	77	36	63.3
83	Commercentre e/o Bake	11,085	73	16	11	6.3%	1.3%	45	100		185	86	40	64.0
85	Commercentre w/o Dimension	7,896	73	16	11	3.0%	0.3%	45	100		124	57	27	61.4
86	Interstate 5	201,000	61	16	23	2.4%	3.1%	70	150	-8	3326	1544	717	72.2
87	Route 241	40,100	73	16	11	2.0%	1.1%	65	230	-5	712	330	153	62.4

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Appendix F

Transportation Impact Analysis

Transportation Impact Analysis

Lake Forest General Plan Update

Lake Forest, California

November 2019

Transportation Impact Analysis

Lake Forest General Plan Update

Lake Forest, California

Prepared For:
City of Lake Forest
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Project No. 21181

November 2019

TABLE OF CONTENTS

Executive Summary 2
Significant Transportation Impacts 2
Roadway Improvement Recommendations 2
Introduction 5
Project Description 5
Study Locations 9
Analysis Scenarios 13
Existing Conditions 16
Physical Setting 16
Roadway Network 16
Transit Service 21
Bicycle Facilities 25
Pedestrian Conditions 28
Freight/Goods Movement 29
Aviation System 30
Existing Traffic Conditions 32
Regulatory Setting 41
Federal 41
State 41
Regional 45
Local 48
Level of Service Analysis 51
Traffic Volume Forecasting 51
Assumed Future Roadway Improvements 51
Roadway Segment Analysis 52
Intersection Analysis 57
Recommended Improvements 64
Transportation Impact Analysis 68
General Plan Traffic 68
Standards of Significance 68
Item 1: VMT 70
Item 2: Congestion Management Program 70
Item 3: Influence Air Travel Patterns 71
Item 4: Design and Incompatible Use Hazards 71

Item 5: Emergency Access 72
Item 6: Transit, Bicycle, or Pedestrian Impacts 73
Conclusions and Recommendations 76
Significant Transportation Impacts 76
Roadway Improvement Recommendations 76

LIST OF FIGURES

Figure 1: City of Lake Forest 7
Figure 2: Mobility Element Roadway Classifications 8
Figure 3: Study Intersections 14
Figure 4: 2008 Circulation Element Roadway Classifications 20
Figure 5: Existing Transit Facilities 24
Figure 6: Existing Bicycle/Pedestrian Facilities 27
Figure 7: Existing Freight Routes 31
Figure 8: Existing AM & PM Peak Hour Traffic Volumes and Lane Geometries 39
Figure 9: Cumulative (2040) Plus Plan AM & PM Peak Hour Traffic Volumes and Lane Geometries . 63

APPENDICES

Appendix 1: Existing Traffic Count Data
Appendix 2: Existing (2018) Intersection Level of Service Worksheets
Appendix 3: Assumed Future Roadway Improvements
Appendix 4: Cumulative (2040) Plus Plan Intersection Level of Service Worksheets
Appendix 5: Cumulative (2040) Plus Plan (with Recommended Improvements) Intersection Level of Service Worksheets

LIST OF TABLES

Table 1: Proposed General Plan Update Land Use Designations and Intensity Assumptions 5
Table 2: Study Intersections 9
Table 3: Study Roadway Segments 11
Table 4: OCTA Transit Lines and Ridership (Fiscal Year 2016) 22
Table 5: Pedestrian Facility Conditions in Lake Forest 28
Table 6: Intersection Level of Service and V/C Ratios (ICU Methodology) 32
Table 7: Intersection Level of Service and Delay Thresholds (HCM Methodology) 33
Table 8: Daily Roadway Capacity Values for Arterial Level of Service 33
Table 9: Existing (2018) Intersection Level of Service – Weekday AM/PM Peak Hours 34
Table 10: Existing (2018) Roadway Segment Level of Service 36
Table 11: Cumulative (2040) Plus Plan Roadway Segment Level of Service 52
Table 12: Cumulative (2040) Plus Plan Intersection Level of Service (ICU Methodology) 58
Table 13: Cumulative (2040) Plus Plan Intersection Level of Service (HCM Methodology) 61
Table 14: Cumulative (2040) VMT Comparison 70
Table 15: Cumulative (2040) Plus Plan Intersection Level of Service (CMP Intersections) 71

Section 1
Executive Summary

EXECUTIVE SUMMARY

The City of Lake Forest encompasses approximately 16.7 square miles in Orange County, California. The city is bordered by the City of Irvine to the west, the City of Laguna Woods to the southwest, the City of Laguna Hills to the south, the City of Mission Viejo to the east, and unincorporated County of Orange to the north and to the west. The City has prepared its 2040 General Plan Update ("Plan"), which is an update to the current (1994) Lake Forest General Plan. The Plan is intended to guide long-term growth, traffic patterns, housing, and resources conservation.

The Plan aims to achieve the community's vision of a resilient, safe, attractive, and vibrant city that maintains and improves residents', employees', and visitors' quality of life. The Plan is designed to enhance resources and set the framework for development and investment that will help the City achieve its vision.

The Plan proposes significant infill development in the city with a mix of uses, as noted below. Please note, the proposed land uses represent the full citywide buildout and include existing development in the city.

- 29,167 single family residential units
- 22,167 multi-family residential units
- Approximately 5,567,524 square feet of office uses
- Approximately 9,733,234 square feet of retail uses
- Approximately 12,425,826 square feet of other non-residential uses

Kittelson & Associate ("Kittelson") has prepared a transportation analysis of the Plan. Below is a summary of results of the transportation analysis conducted for the Plan, including any significant impact findings and recommended roadway improvements.

SIGNIFICANT TRANSPORTATION IMPACTS

The California Environmental Quality Act (CEQA) transportation impact analysis of the Plan found no significant impacts for the following topics:

- Vehicle Miles Traveled (VMT)
- Air Traffic
- Safety Hazards
- Emergency Access
- Public Transit, Bicycle, or Pedestrian Facilities

ROADWAY IMPROVEMENT RECOMMENDATIONS

In addition to the transportation analysis conducted under CEQA requirements, Kittelson analyzed roadway segment and intersection operations with Plan implementation, to address the City's goal of

providing satisfactory roadway operations and traffic flow within Lake Forest. Recommended improvements on these facilities were provided to accommodate long-term buildout of vehicular traffic. It is recommended that the City continue to monitor traffic volumes on these and other roadway facilities to determine the timing and extent of any improvements as development projects are implemented in the city.

Three roadway segments with recommended improvements are as follows:

- Portola Parkway
- Bake Parkway
- Lake Forest Drive

Eight intersections with recommended improvements are as follows:

- Portola Parkway & SR-241 Ramps
- Alton Parkway & SR-241 Ramps
- Bake Parkway & Rancho Parkway South
- Bake Parkway & Jeronimo Road
- Lake Forest Drive & Rockfield Boulevard
- Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota
- Paseo De Valencia & Avenida De La Carlota
- El Toro Road & Bridger Road/I-5 NB Ramps

Section 2
Introduction

INTRODUCTION

This report documents the transportation impact analysis for the General Plan Update and summarizes the methodology, findings, and conclusions of the analysis.

The purpose of the study is to assess potentially significant impacts resulting from the implementation of the General Plan Update on the citywide transportation system and to identify measures to mitigate them. The study also serves as the basis for the transportation component of the Environmental Impact Report (EIR) that will be prepared for the General Plan Update.

PROJECT DESCRIPTION

The City of Lake Forest encompasses approximately 16.7 square miles in Orange County, California. The city is bordered by the City of Irvine to the west, the City of Laguna Woods to the southwest, the City of Laguna Hills to the south, the City of Mission Viejo to the east, and unincorporated County of Orange to the north and to the west. The City of Lake Forest is shown in Figure 1.

The City of Lake Forest 2040 General Plan Update, which is an update to the current (1994) Lake Forest General Plan,[1] is intended to guide long-term growth, traffic patterns, housing, and resources conservation. Table 1 outlines the land use designations and buildout projections for dwelling units, residents, non-residential square footage, and employment proposed under the General Plan Update. In total, the General Plan would result in a buildout of approximately 51,334 housing units, 152,462 residents, 27,726,585 non-residential square feet, and 52,241 employees within the City's boundaries.

Table 1: Proposed General Plan Update Land Use Designations and Intensity Assumptions

Land Use Designation	Dwelling Units	Population	Non-Residential Square Footage	Employees
Low Density Residential	17,023	50,559	0	0
Low-Medium Density Residential	9,589	28,481	0	0
Medium Density Residential	7,931	23,555	0	0
High Density Residential	620	1,840	0	0
Commercial	0	0	3,054,326	6,787
Professional Office	0	0	110,398	368
Mixed-Use	7,567	22,473	5,133,082	11,407
Mixed-Use 32	3,234	9,605	1,100,607	2,446
Mixed-Use 60	3,265	9,696	1,481,288	3,292
Mixed-Use - Office	0	0	513,715	1,284
Business Park	0	0	4,545,819	7,576
Light Industrial	0	0	9,565,602	15,943
Urban Industrial 25	1,155	3,430	914,637	1,524

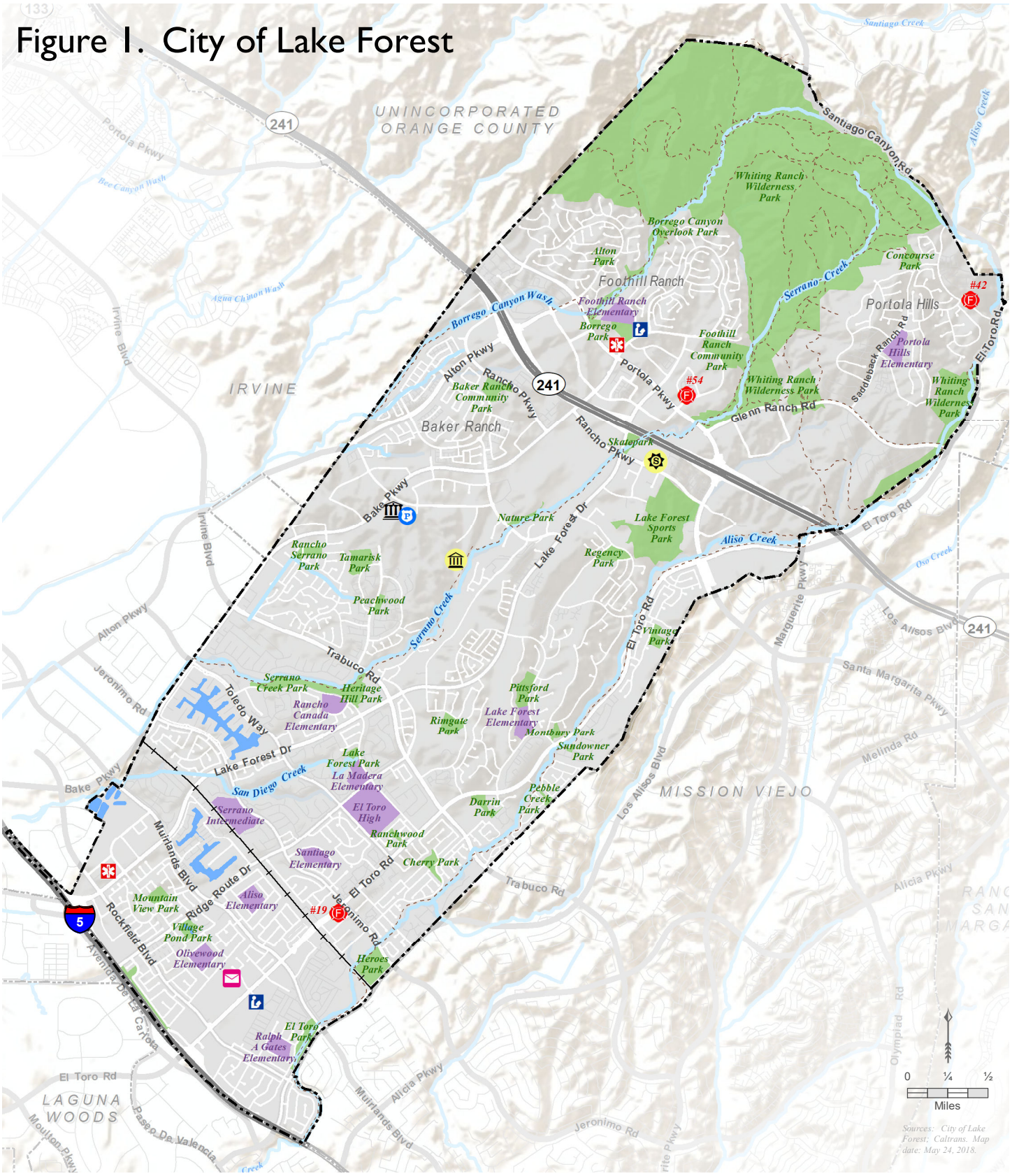
[1] The City's Circulation Element was revised in 2008.

Land Use Designation	Dwelling Units	Population	Non-Residential Square Footage	Employees
Urban Industrial 43	950	2,823	460,007	767
Public Facility	0	0	811,508	812
Community Park/Open Space	0	0	27,148	27
Regional Park/Open Space	0	0	8,448	8
Total	**51,334**	**152,462**	**27,726,585**	**52,241**

Source: De Novo Planning Group, 2019

In addition to land use, the General Plan Mobility Element includes a map of proposed roadway classifications, as shown in Figure 2.

Figure 1. City of Lake Forest



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails
- City Hall
- Future Civic Center
- Fire Station
- Police Center
- Sheriff's Department
- Urgent Care Facility
- Library
- U.S. Post Office

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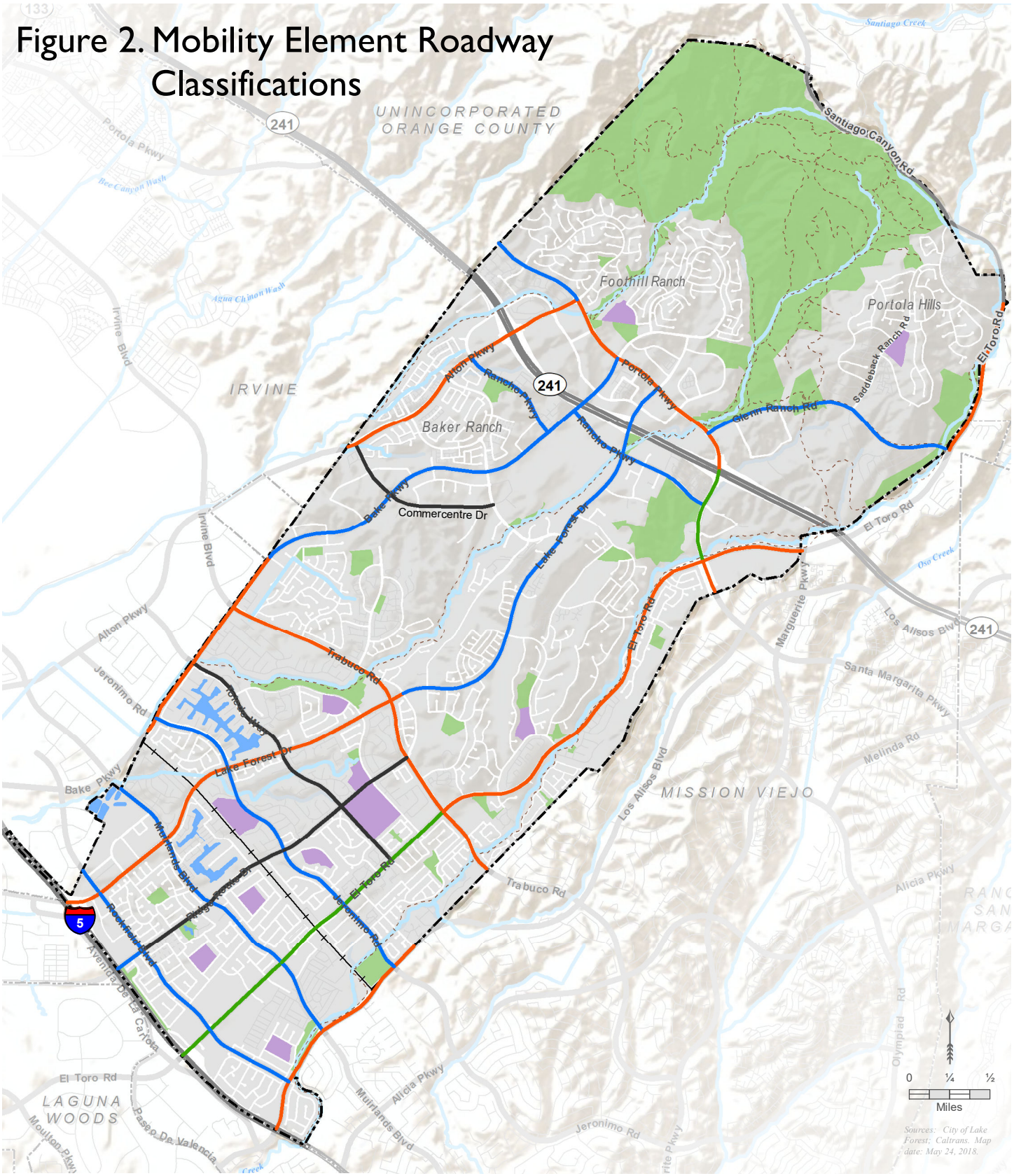
A Land Use Planning, Design, and Environmental Firm

Figure 2. Mobility Element Roadway Classifications



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails

Roadway Classifications

- Principal Arterial
- Major Arterial
- Primary Arterial
- Secondary Arterial
- Collector

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STUDY LOCATIONS

Study locations were developed in conjunction with the City of Lake Forest staff.

The following signalized intersections were analyzed for traffic conditions during the AM peak hour and PM peak hour using City of Lake Forest and/or other relevant jurisdictions' significance criteria as shown in Table 2 and in Figure 3.

Table 2: Study Intersections

#	Intersection	Jurisdiction
1	Alton Parkway & Portola Parkway	Lake Forest
2	Bake Parkway & Portola Parkway	Lake Forest
3	Lake Forest Drive & Portola Parkway	Lake Forest
4	Glenn Ranch Road & Portola Parkway	Lake Forest
5	Portola Parkway & SR-241 Ramps	Lake Forest / Caltrans
6	Alton Parkway & SR-241 Ramps	Lake Forest / Caltrans
7	Lake Forest Drive & SR-241 NB On-Ramp	Lake Forest / Caltrans
8	Lake Forest Drive & SR-241 SB Off-Ramp	Lake Forest / Caltrans
9	Bake Parkway & Rancho Parkway	Lake Forest
10	Lake Forest Drive & Rancho Parkway	Lake Forest
11	Bake Parkway & Rancho Parkway South	Lake Forest
12	El Toro Road & Portola Parkway/Santa Margarita Parkway	Lake Forest
13	Bake Parkway & Commercentre Drive	Lake Forest
14	Bake Parkway & Irvine Boulevard/Trabuco Road	Lake Forest
15	Lake Forest Drive & Trabuco Road	Lake Forest
16	Ridge Route Drive & Trabuco Road	Lake Forest
17	El Toro Road & Trabuco Road	Lake Forest
18	Bake Parkway & Toledo Way	Lake Forest
19	Lake Forest Drive & Toledo Way	Lake Forest
20	Ridge Route Drive & Toledo Way	Lake Forest
21	El Toro Road & Toledo Way	Lake Forest
22	Bake Parkway & Jeronimo Road	Lake Forest
23	Lake Forest Drive & Jeronimo Road	Lake Forest
24	Ridge Route Drive & Jeronimo Road	Lake Forest
25	El Toro Road & Jeronimo Road	Lake Forest
26	Los Alisos Boulevard & Jeronimo Road	Lake Forest
27	Lake Forest Drive & Muirlands Boulevard	Lake Forest
28	Ridge Route Drive & Muirlands Boulevard	Lake Forest
29	El Toro Road & Muirlands Boulevard	Lake Forest
30	Los Alisos Boulevard & Muirlands Boulevard	Lake Forest
31	Lake Forest Drive & Rockfield Boulevard	Lake Forest

#	Intersection	Jurisdiction
32	Ridge Route Drive & Rockfield Boulevard	Lake Forest
33	El Toro Road & Rockfield Boulevard	Lake Forest
34	Los Alisos Boulevard & Rockfield Boulevard	Lake Forest
35	Lake Forest Drive & I-5 NB Ramps	Lake Forest / Caltrans
36	Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota	Laguna Hills / Caltrans
37	Paseo De Valencia & Avenida De La Carlota	Laguna Hills / Caltrans
38	El Toro Road & Bridger Road/I-5 NB Ramps	Lake Forest / Caltrans
39	El Toro Road & Avenida De La Carlota	Laguna Hills
40	Portola Parkway & Rancho Parkway	Lake Forest
41	Alton Parkway & Rancho Parkway South	Lake Forest
42	Alton Parkway & Commercentre Drive	Lake Forest
51	El Toro Road & Glenn Ranch Road	Lake Forest
56	Bake Parkway & Dimension Drive	Lake Forest
57	Lake Forest Drive & Dimension Drive	Lake Forest
60	Dimension Drive & Commercentre Drive	Lake Forest
101	Lake Forest Drive & Pittsford Drive	Lake Forest
102	El Toro Road & Northcrest Drive	Lake Forest

As shown in the table, the following three study intersections are located in the City of Laguna Hills:

- #36 – Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota
- #37 – Paseo De Valencia & Avenida De La Carlota
- #39 – El Toro Road & Avenida De La Carlota

The following eight study intersections are located at California Department of Transportation (Caltrans) freeway ramps and will also be analyzed under Caltrans methodologies and standards:

- #5 – Portola Parkway & SR-241 Ramps
- #6 – Alton Parkway & SR-241 Ramps
- #7 – Lake Forest Drive & SR-241 NB On-Ramp
- #8 – Lake Forest Drive & SR-241 SB Off-Ramp
- #35 – Lake Forest Drive & I-5 NB Ramps
- #36 – Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota
- #37 – Paseo De Valencia & Avenida De La Carlota
- #38 – El Toro Road & Bridger Road/I-5 NB Ramps

The following intersections are Congestion Management Plan (CMP)-designated intersections according to the Orange County CMP and will also be analyzed under CMP standards:

- #17 – El Toro Road & Trabuco Road

- #38 – El Toro Road & Bridger Road/I-5 NB Ramps
- #39 – El Toro Road & Avenida De La Carlota (in Laguna Hills)

Table 3 shows the roadway segments that were analyzed for traffic conditions on a daily traffic volume basis.

Table 3: Study Roadway Segments

Roadway	Segment
Trabuco Road	North of Lake Forest Drive
	North of Ridge Route Drive
	North of El Toro Road
	South of El Toro Road
Toledo Way	North of Lake Forest Drive
	South of Lake Forest Drive
	South of Ridge Route Drive
Jeronimo Road	North of Lake Forest Drive
	North of Ridge Route Drive
	North of El Toro Road
	South of El Toro Road
Muirlands Boulevard	North of Lake Forest Drive
	North of Ridge Route Drive
	South of Ridge Route Drive
	South of El Toro Road
Rockfield Boulevard	North of Lake Forest Drive
	North of Ridge Route Drive
	North of El Toro Road
	North of Los Alisos Boulevard
Portola Parkway	North of Alton Parkway
	North of Bake Parkway
	North of Lake Forest Drive
	North of Glenn Ranch Road
	North of SR-241
	South of SR-241
	North of El Toro Road
	South of El Toro Road
Rancho Parkway South	North of Bake Parkway
Rancho Parkway	South of Bake Parkway
	South of Lake Forest Drive
Glenn Ranch Road	Portola Parkway to Saddleback Ranch Road
	Saddleback Ranch Road to El Toro Road

Roadway	Segment
Alton Parkway	West of Portola Parkway
	West of SR-241
	West of Rancho Parkway South
	East of Trabuco Road
Bake Parkway	West of Towne Center Drive
	East of Commercentre Drive
	West of Commercentre Drive
	West of Trabuco Road
	West of Toledo Way
Lake Forest Drive	West of Portola Parkway
	East of Rancho Parkway
	West of Rancho Parkway
	East of Trabuco Road
	West of Trabuco Road
	East of Jeronimo Road
	East of Muirlands Boulevard
	West of Muirlands Boulevard
	West of Rockfield Boulevard
Ridge Route Drive	East of Toledo Way
	East of Jeronimo Road
	West of Jeronimo Road
	East of Muirlands Boulevard
	East of Rockfield Boulevard
	West of Rockfield Boulevard
El Toro Road	East of Glenn Ranch Road
	West of Glenn Ranch Road
	East of Santa Margarita Parkway
	West of Santa Margarita Parkway
	East of Trabuco Road
	West of Trabuco Road
	East of Jeronimo Road
	East of Muirlands Boulevard
	West of Muirlands Boulevard
	West of Rockfield Boulevard
Los Alisos Boulevard	East of Jeronimo Road
	East of Muirlands Boulevard
	West of Muirlands Boulevard
	West of Rockfield Boulevard
Commercentre Drive	South of Alton Parkway

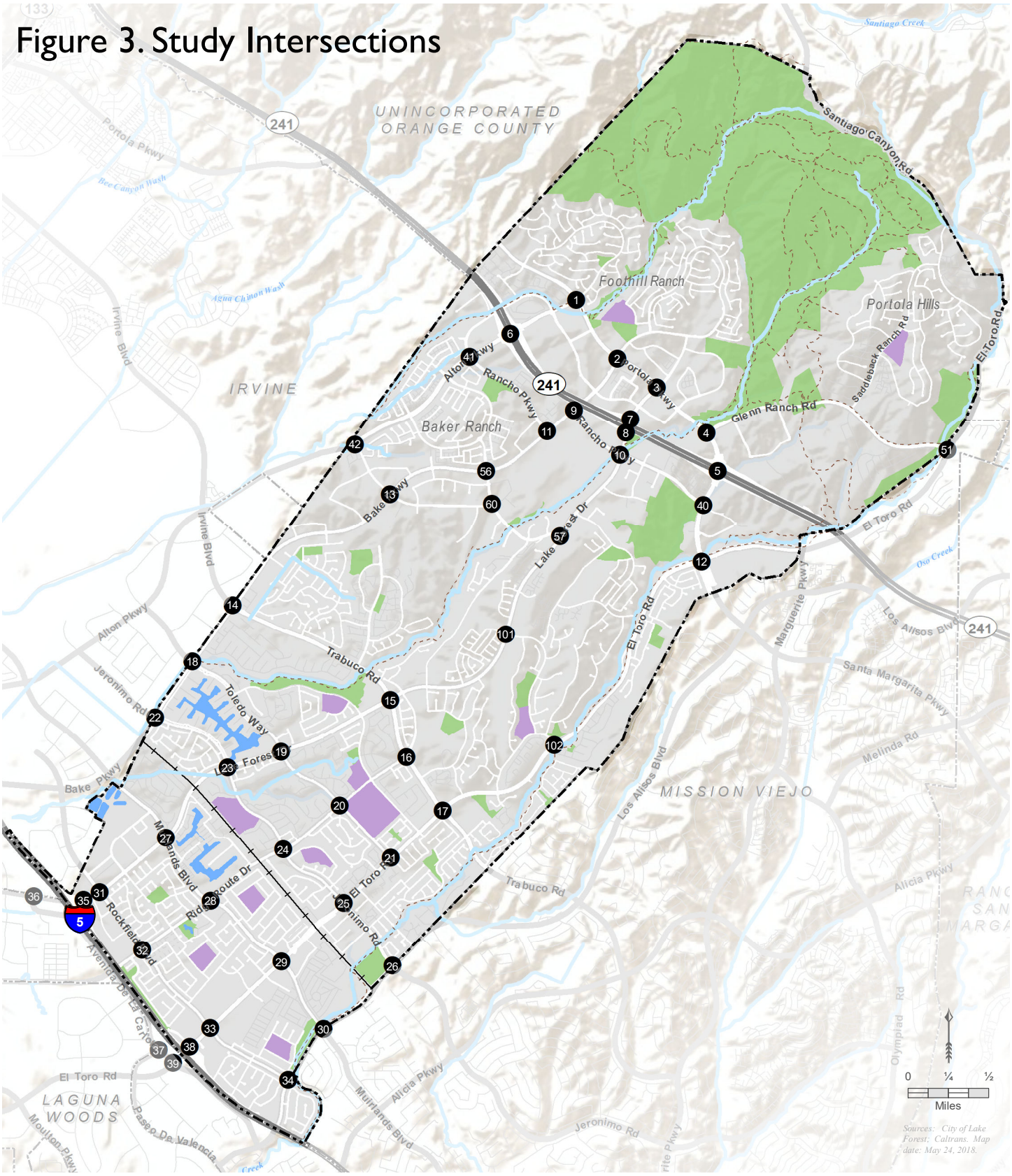
Roadway	Segment
	South of Bake Parkway
	North of Dimension Drive
Dimension Drive	North of Commercentre Drive
	South of Commercentre Drive

ANALYSIS SCENARIOS

As part of the assessment, the following scenarios were developed and analyzed:

- Existing (2018) Conditions – Study intersections and roadway segments were analyzed using existing traffic counts, collected in 2018.
- Cumulative (2040) Plus Plan Conditions – This scenario represents the land uses, densities and circulation network changes for full buildout of the General Plan in the year 2040 and consists of forecast volumes using the Orange County Transportation Analysis Model (OCTAM) and (Lake Forest Traffic Analysis Model) LFTAM travel demand models. This scenario also includes roadway improvements that are expected to be implemented by 2040.

Figure 3. Study Intersections



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails
- Study Intersections

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Section 3
Existing Conditions

EXISTING CONDITIONS

PHYSICAL SETTING

This section summarizes existing mobility conditions in the City of Lake Forest related to vehicles, transit, bicycles, pedestrians, freight/goods movement, aviation, and traffic operations.

ROADWAY NETWORK

The roadway system in Lake Forest consists of arterial roadways as well as regional freeways and highways that serve local and regional traffic demand. The existing vehicular facilities in Lake Forest are discussed below.

Local Arterial Roadways

Roadways within Lake Forest are classified in the current Circulation Element (revised 2008) of the 1994 Lake Forest General Plan as principal arterials, major arterials, primary arterials, secondary arterials, and commercial streets; these classifications are shown in Figure 4.

- **Principal Arterials**. According to the current Circulation Element, principal arterials generally have eight lanes and a raised median with a daily capacity of approximately 70,000 vehicles. On-street parking and left-turns at unsignalized minor street and driveway intersections are typically prohibited.
- **Major Arterials**. Major arterials generally have six lanes and a raised median with a daily capacity of approximately 56,000 vehicles. On-street parking is typically prohibited. In addition, signalized intersections are preferable to unsignalized intersections along major arterials.
- **Primary Arterials**. Primary arterials generally have four lanes and a painted or raised median with a daily capacity of approximately 36,000 vehicles. Similar to other arterial classifications in Lake Forest, on-street parking is typically prohibited.
- **Secondary Arterials**. Secondary arterials generally have four lanes without a painted or raised median. The daily capacity for a secondary arterial is approximately 25,000 vehicles. Unlike principal, major, and primary arterials, secondary arterials can provide on-street parking and access via unsignalized intersections at minor streets.
- **Commercial Streets**. The current Circulation Element recognizes that certain streets near commercial centers can have different daily traffic patterns compared to arterials in areas that are predominantly residential. For example, streets in commercial areas experience heavier traffic volumes after the morning peak hour and during non-peak hours compared to residential areas. Due to these unique characteristics, certain arterials in commercial areas are designated as commercial streets.

Individual arterials in Lake Forest and their current classifications are described below. In general, the north-south roadways provide connections to neighboring cities such as Mission Viejo and Irvine, and the east-west roadways connect Lake Forest to Laguna Woods, Cleveland National Park, SR-241, and I-5.

El Toro Road is an east-west road connecting I-5 to SR- 241. It serves commercial centers and provides access to several neighborhoods. There are four 11-foot travel lanes in each direction, between Interstate 5 and Muirlands Boulevard. North of Muirlands Boulevard, El Toro has three travel lanes in each direction. Opposing travel lanes are separated by a painted median and two-way left turn lane. There are sidewalks on both sides of the street, except between Creekside and Raintree Lane, where there is only a sidewalk on the west side. The Aliso Creek bikeway, a shared use path, runs along the south side of the street between Normandale Drive and Live Oak Canyon Road. The posted speed limit is 55 miles per hour (mph) east of North Crest, 50 mph between North Crest and Jeronimo Road, and 40 mph west of Jeronimo Road. On-street parking is not permitted. El Toro Road is classified as a major arterial east of Trabuco Road, a principal arterial between Trabuco Road and Muirlands Boulevard, and a commercial street between Muirlands Boulevard and I-5.

Lake Forest Drive is an east-westroad connecting I-5 to SR-241. It serves commercial centers and provides access to several neighborhoods. There are three 11-foot travel lanes in each direction west of Trabuco Road and two travel lanes in each direction east of Trabuco Road. Opposing travel lanes are separated by a raised median. Sidewalks are present along both sides of the roadway throughout the City. On-street parking is not permitted. Lake Forest Drive has Class II bike lanes on both sides of the street, between Portola Parkway and Muirlands Boulevard. The posted speed limit varies between 40 mph and 55 mph. Lake Forest Drive is classified as a commercial street from Portola Parkway to Rancho Parkway, a primary arterial from Rancho Parkway to Trabuco Road, a major arterial from Trabuco Road to Muirlands Boulevard, and a commercial street from Muirlands Boulevard to I-5.

Alton Parkway is an east-westroad traveling between Portola Parkway, SR-241, and the westerly City limit, providing connectivity from Foothill Ranch to I-5 and I-405. There are three 11- to 12-foot travel lanes in each direction, separated by a raised median. There are sidewalks on both sides of the street and Class II bike lanes are provided west of Portola Parkway. The posted speed limit is 40 mph. Alton Parkway is classified as a major arterial.

Bake Parkway is an east-westuth road running between Portola Parkway and the City limits and providing connectivity from Foothill Ranch to I-5. There are two 11- to 12-foot travel lanes in each direction, separated by a raised median. Sidewalks and Class II bike lanes are provided on both sides of the street. The posted speed limit is 50 mph. Bake Parkway is classified as a commercial street east of Rancho Parkway, a primary arterial between Rancho Parkway and Pointe Drive, and a major arterial west of Pointe Drive.

Los Alisos Boulevard is an east-westroadway running along a portion of the easterly City limits. Within Lake Forest, Los Alisos Boulevard mainly serves residential neighborhoods. There are three 11-foot travel lanes in each direction, separated by a raised median. Sidewalks and Class II bike lanes are provided along

both sides of the roadway. On-street parking is not permitted. The posted speed limit is 45 mph. Los Alisos Boulevard is classified as a major arterial.

Portola Parkway is a north-south roadway traveling parallel to and across SR-241, between the city boundaries with Irvine and Mission Viejo. East of SR 241, there are two to three 11- to 12-foot travel lanes in each direction, separated by a raised median. West of SR 241, there are three 11 to 12-foot travel lanes. Sidewalks and Class II bike lanes are provided along both sides of the roadway. On-street parking is not permitted. The posted speed limit is 45 mph. Portola Parkway is classified as a primary arterial north of Alton Parkway, a major arterial between Alton Parkway and SR-241, a major arterial between SR-241 and El Toro Road, and a major arterial south of El Toro Road. Portola Parkway presently terminates at the City's northwest limits (past Paloma). The OCTA MPAH shows Portola Parkway's future alignment as continuous between the northerly City limits and SR-241 within Irvine.

Trabuco Road is a north-south roadway, bisecting Lake Forest. There are three 11- to 12-foot travel lanes in each direction north of El Toro Road and two travel lanes in each direction south of El Toro Road, separated by a raised median. Sidewalks are present on both sides of the road, except for a short extent on the Aliso Creek bridge. Class II bike lanes are provided along both sides of the roadway. On-street parking is not permitted. The posted speed limit is 45 mph. Trabuco Road is classified as a major arterial. North of Bake Parkway (in Irvine) this roadway is known as Irvine Boulevard.

Toledo Way is a north-south roadway, extending from Alton Parkway (in Irvine) to El Toro Road. There are two 10- to 12-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks are present on both sides of the road. Class II bike lanes are available on both sides of the street north of Ridge Route Drive. On-street parking is permitted on the east side of Toledo Way between El Toro Road and El Toro High School. The posted speed limit varies between 45 and 50 mph; between Ridge Route Drive and El Toro Road (adjacent to El Toro High School) the speed limit is 25 mph when children are present. Toledo Way is classified as a Secondary Arterial.

Jeronimo Road is a north-south roadway, bisecting Lake Forest. There are two 10- to 12-foot travel lanes in each direction; opposing travel lanes are separated by a two-way left turn lane north of El Toro Road and by a raised median south of El Toro Road. Sidewalks and Class II bike lanes are provided on both sides of the road. On-street parking is not permitted except on the west side in front of the commercial center between Orange Avenue and Cherry Avenue. The posted speed limit varies between 40 and 45 mph; adjacent to Serrano Middle School, the speed limit is 25 mph when children are present. Jeronimo Road is classified as a primary arterial.

Muirlands Boulevard is a north-south roadway, providing access to residential and commercial uses in Lake Forest. There are two 11- to 14-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks and Class II bike lanes are provided on both sides of the road. On-street parking is not permitted. The posted speed limit is 45 mph. Muirlands Boulevard is classified as a primary arterial.

Rockfield Boulevard is a north-south roadway, running parallel east of I-5 and providing access to residential and commercial uses. There are two 10- to 13-foot travel lanes in each direction, separated

by either a raised median or a two-way left turn lane. Sidewalks are provided on both sides of the road. Class II bike lanes are available between the northerly City limit and Lake Forest Drive, Ridge Route Drive and Cavanaugh Road, and El Toro Road and Los Alisos Boulevard. On-street parking is not permitted. The posted speed limit is 45 mph. Rockfield Boulevard is classified as a commercial street west of Ridge Route Drive and a primary arterial east of Ridge Route Drive.

Ridge Route Drive is an east-west road between Trabuco Road and a terminus point at I-5, providing connectivity to residential and retail uses. There are two 11- to 12-foot travel lanes in each direction, which is reduced to one lane in each direction at the railroad underpass between Muirlands Boulevard and Jeronimo Road. South of Costa Bella Drive, opposing travel lanes are separated by a raised median; north of Costa Bella Drive, opposing travel lanes are either undivided or separated by a two-way left turn lane. Sidewalks are provided on both sides of the street, except at the railroad underpass which only provides a sidewalk on the north side. Class II bike lanes are provided north of Rockfield Boulevard except for a short gap at the railroad crossing. On-street parking is prohibited east of Rockfield Boulevard. The posted speed limit is 40 mph; between Serrano Road and Toledo Way (adjacent to El Toro High School and La Madera Elementary School) the speed limit is 25 mph when children are present. Ridge Route Drive is classified as a secondary arterial.

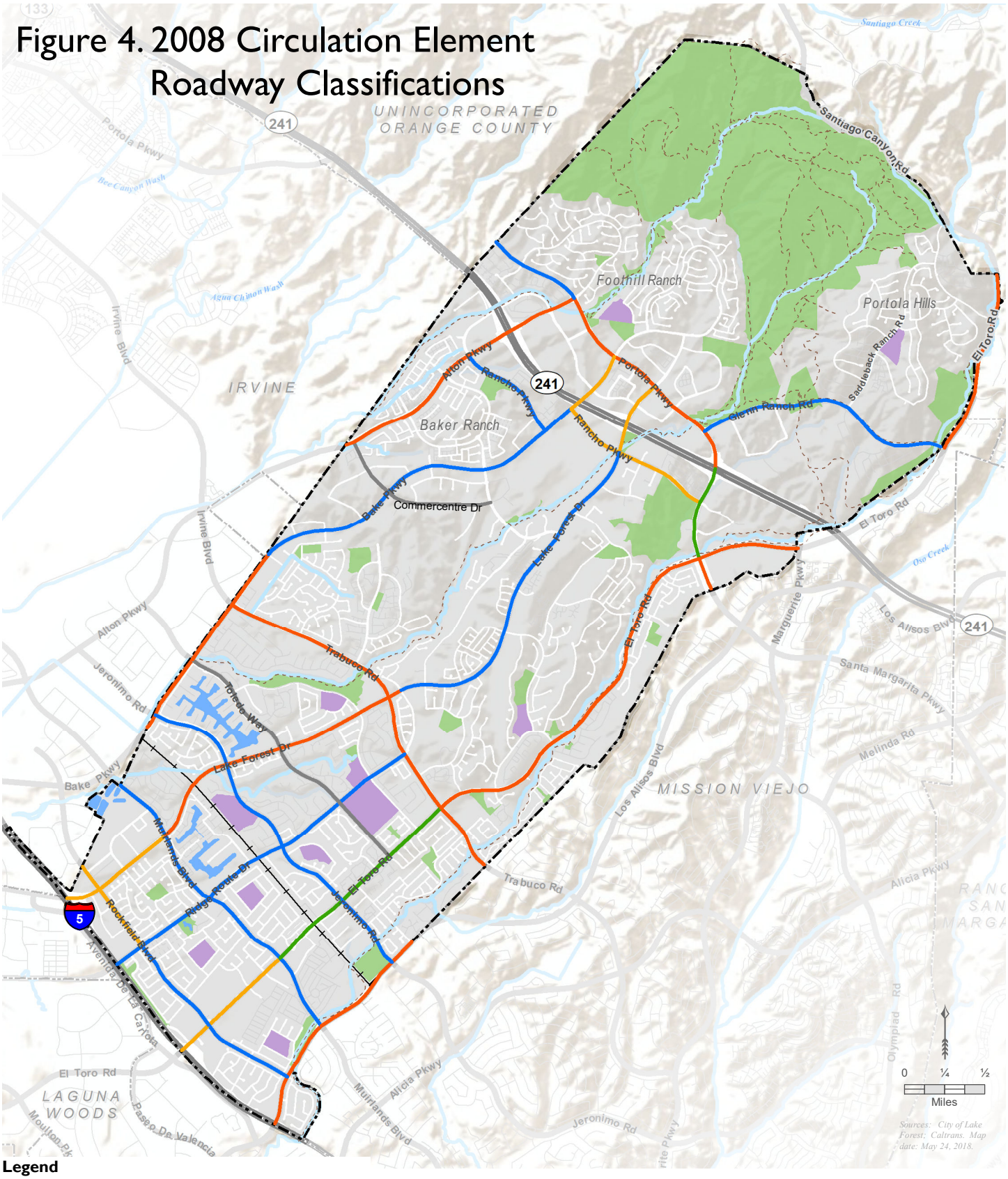
Glenn Ranch Road is an east-west roadway between Portola Parkway and El Toro Road, providing access to residential neighborhoods and several recreational hiking trails. There are two 11- to 24-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks are provided on both sides of the road west of Saddleback Ranch Road and on the north side of the road east of Saddleback Ranch Road. On-street parking is not permitted, and the posted speed limit is 50 mph. Glenn Ranch Road is classified as a primary arterial.

Rancho Parkway is a north-south roadway between Bake Parkway and Portola Parkway. There are two 12- to 14-foot lanes in each direction, separated by a raised median. Sidewalks are provided on both sides of the road south of Lake Forest drive and on the east side of Rancho Parkway north of Lake Forest Drive. Class II bike lanes are provided in both directions. On-street parking is permitted south of Hermana Circle. The posted speed limit is 45 mph. Rancho Parkway is classified as a commercial street.

Rancho Parkway South is an east-west roadway between Alton Parkway and Bake Parkway; west of Alton Parkway, Rancho Parkway South continues as Towne Centre Drive South. There are two 13- to 14-foot lanes in each direction, separated by a raised median. Sidewalks and Class II bike lanes are provided on both sides of the road. On-street parking is not permitted. The posted speed limit is 40 mph. Rancho Parkway South is classified as a primary arterial.

Commercentre Drive is a north-south roadway connecting Alton Parkway, Bake Parkway, and Dimension Drive and provides access to office/industrial uses and Lake Forest City Hall. There are two 11- to 14-foot travel lanes in each direction, separated by a two-way left turn lane. Sidewalks are provided on both sides of the street. On-street parking is not permitted. The posted speed limit is 45 mph. Commercentre Drive is classified as a secondary arterial.

Figure 4. 2008 Circulation Element Roadway Classifications



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails

Roadway Classifications

- Principal Arterial
- Major Arterial
- Primary Arterial
- Secondary Arterial
- Commercial Street

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Freeways

Freeways are distinguished from other types of roadways in that abutting lands have no right or easement of access to or from their abutting lands or, in some cases, such owners have only limited or restricted right or easement of access. Freeways that travel through or adjacent to Lake Forest provide regional connectivity and access to other local freeways are described below.

Interstate 5 (I-5) is a north-south freeway connecting the Mexican border to the Canadian border, running through California, Oregon, and Washington. I-5 runs along Lake Forest's southwestern City limit and provides connections to Los Angeles County, northern and southern Orange County, and San Diego County, as well as connections to I-405, SR-133, and other regional freeways. Access to and from I-5 is possible via on- and off-ramps at El Toro Road, Lake Forest Drive, Bake Parkway, and Alton Parkway. Adjacent to Lake Forest, the freeway has five 12-foot general purpose lanes in each direction; there are two high-occupancy vehicle (HOV) (2+ persons) lanes in each direction north of El Toro Road and one HOV lane in each direction south of El Toro Road. The posted speed limit is 65 mph.

State Route 241 (SR-241) is a north-south tolled state highway operated by TCA and traveling from Rancho Santa Margarita to its terminus at State Route 91 (SR-91) in Anaheim. SR-241 bisects Lake Forest and provides connectivity to other state highways consisting of SR-133, SR-261, and SR-91. Access to and from SR-241 is possible via ramps at Alton Parkway, Lake Forest Drive, and Portola Parkway. Within the city, SR-241 has three 12-foot travel lanes in the northbound direction and two to three travel lanes in the southbound direction. The posted speed limit is 65 mph.

TRANSIT SERVICE

OCTA provides bus service and shared-ride paratransit service within Lake Forest and throughout Orange County. In addition, transit riders can access Metrolink and Amtrak commuter rail services in nearby Irvine and Mission Viejo. There are also a number of park and ride lots in and adjacent to Lake Forest, most of which provide access to OCTA bus routes. The various public transit services in and around Lake Forest are documented below and shown in Figure 5.

Orange County Transportation Authority (OCTA)

OCTA provides bus service in Orange County. It connects Lake Forest with several nearby cities (including Santa Ana, Mission Viejo, Irvine, and Laguna Hills) and several regional destinations such as John Wayne Airport and Irvine Station. OCTA also provides paratransit service through its ACCESS Service. This shared-ride paratransit serves areas with ¾ mile of an OCTA fixed route service. The fare is $3.60 per passenger, one-way, and reservations are required.

Bus routes in Lake Forest are illustrated in Figure 5. Table 4 presents the route information and average weekday daily ridership for all OCTA routes that serve Lake Forest.

Table 4: OCTA Transit Lines and Ridership (Fiscal Year 2016)

Route	Lake Forest Streets Served	Destinations Served	Hours of Operation	Average Weekday Daily Ridership (Route)	Headways (Minutes)	
					Peak	Off-Peak
82	Portola Parkway	Foothill Ranch Towne Center, Saddleback Church Park and Ride, Portola Plaza, Rancho Santa Margarita Towne Center	4:51 AM - 7:58 PM	605	70	70
86	Jeronimo Road	Mission Viejo, Norman Murray Community Center, Serrano Intermediate School, Heroes Park, Irvine Civic Center, Kaiser Permanente, Irvine Spectrum, Irvine Station Area, South Coast Plaza, Orange County Performing Arts Center, John Wayne Airport	5:42 AM - 8:53 PM	653	60	60
89	El Toro Road	Portola Plaza, El Toro High School, Serrano Intermediate School, The Arbor, Saddleback Memorial Medical Center, Laguna Hills Transportation Center, Laguna College of Art & Design, Laguna Beach Bus Station	4:57 AM - 10:15 PM	1,250	30	60
177	Lake Forest Drive	Foothill Ranch Towne Center, Saddleback Memorial Medical Center, and Laguna Hills Transportation Center	5:50 AM - 7:17 PM	350	45	90
206	Bake Parkway	Santa Ana Regional Transportation Center, Irvine Station, Irvine Spectrum, and Foothill Ranch Marketplace and Towne Center	5:44 AM - 5:41 PM	87	30	N/A
480	Bake Parkway	Irvine Station, Irvine Spectrum, and Commercentre	6:07 AM - 5:18 PM	78	25	N/A

Source: Source: OCTA Bus Book (February 11, 2018), OC Transit Vision (January 2018)

Metrolink

Metrolink provides heavy-rail, regional transit service to the counties of Los Angeles, San Bernardino, Orange, Ventura, San Diego, and Riverside. The closest Metrolink station to Lake Forest is the Irvine Station, two miles northwest of Lake Forest. The Irvine Station provides 1,650 parking stalls, and parking is free. The Inland Empire-Orange County and Orange County lines serve the Irvine Station. The Inland Empire-Orange County line connects to Oceanside to the south and to San Bernardino to the North, via a connection in the City of Orange and Anaheim Canyon. The Orange County line also connects to

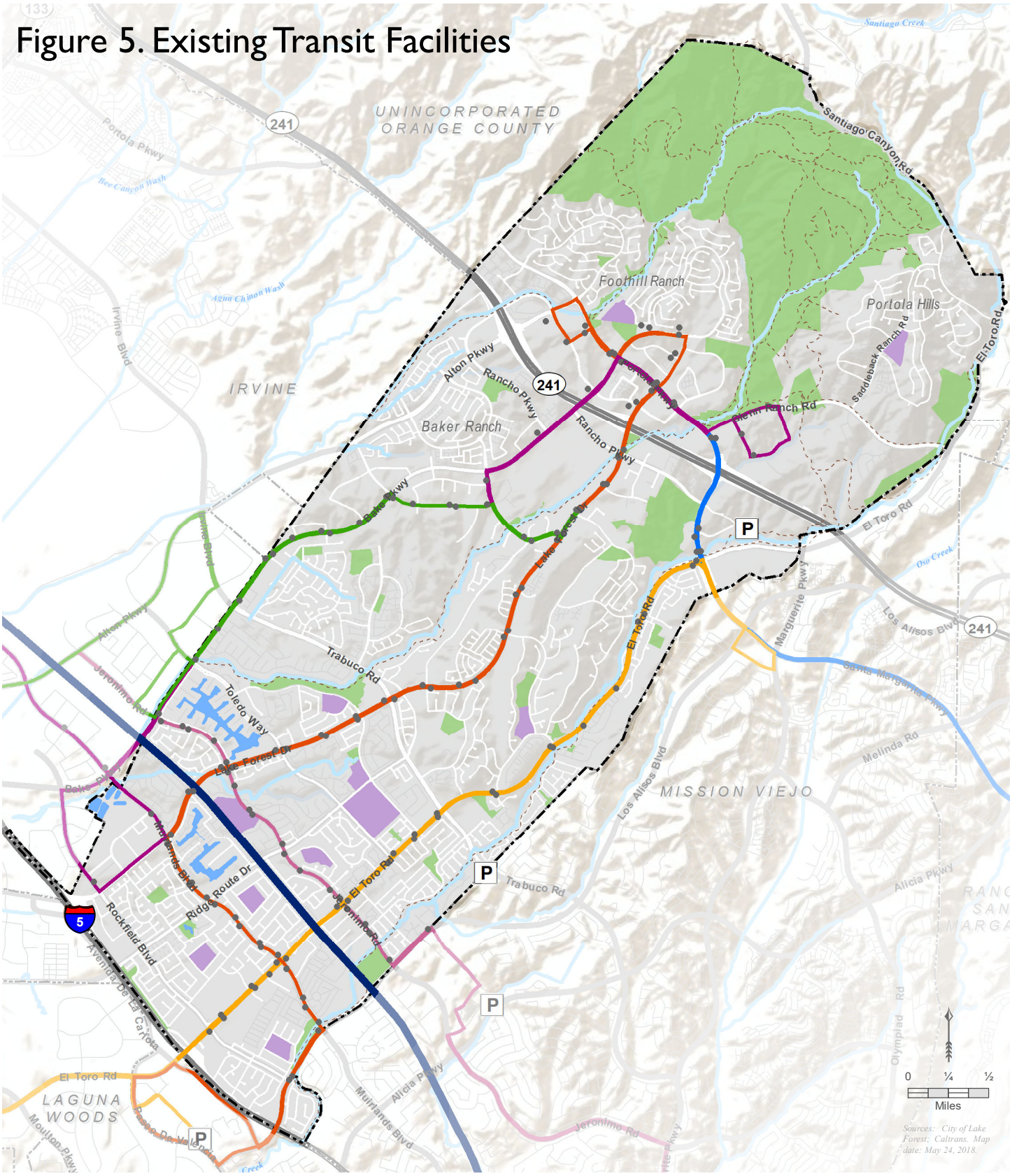
Oceanside to the south, and to downtown Los Angeles to the north, serving several cities in Orange County in between. An average of 1,367 passengers per day board at Irvine Station and an average of 346 passengers per day board at Laguna Niguel/Mission Viejo Station.[2] Metrolink operates Sunday through Saturday with 15 to 30-minute headways during commute periods and provides service between 4:15 AM and 10:41 PM.

Amtrak

Amtrak operates intercity and interstate rail service nationwide. Currently, there are no Amtrak stops located within the city, but residents can access Amtrak Pacific Surfliner line at the Irvine Station, located in Irvine. The line travels along the California coast, connecting San Luis Obispo to San Diego, and serving destinations such as downtown Los Angeles along the way.

[2] Southern California Regional Rail Authority Development of Strategic Plan, 2016.

Figure 5. Existing Transit Facilities



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails

OCTA Bus Routes

- 82
- 86
- 89
- 177
- 206
- 480

- OCTA Bus Stops
- Metrolink/Amtrak
- P Park and Ride

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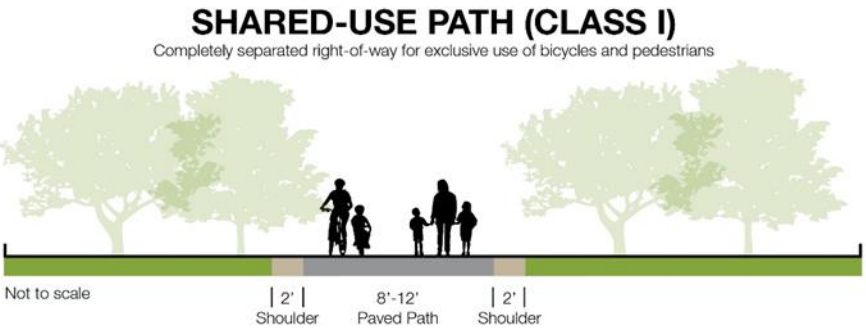
BICYCLE FACILITIES

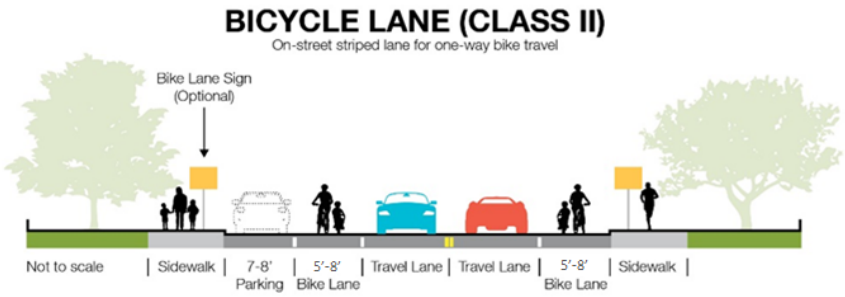
The City of Lake Forest has a bicycle facilities network that consists of both dedicated and shared street space for bicyclists. Figure 6 displays the existing designated bicycle facilities in the city.

Bicycle facilities are categorized into four types, as described and depicted in illustrations below. Note that while the graphics include typical widths for the various facilities, the exact configuration of a bike facility can vary depending on its location and the jurisdiction's preferences.

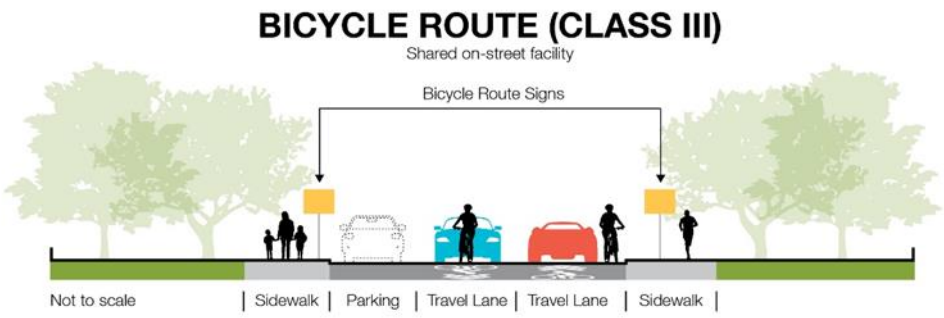
- Class I Bikeway (Bike Path). Also known as a shared path or multi-use path, a bike path is a paved right-of-way for bicycle travel that is completely separate from any street or highway.



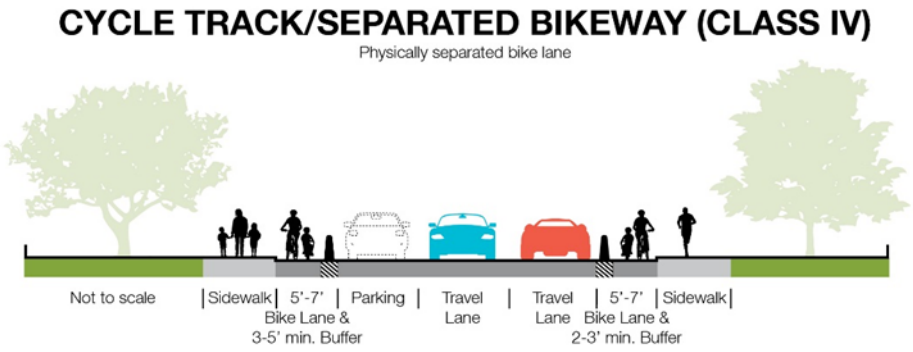
- Class II Bikeway (Bike Lane). A striped and stenciled lane for one-way bicycle travel on a street or highway. This facility could include a buffered space between the bike lane and vehicle lane and the bike lane could be adjacent to on-street parking.



- Class III Bikeway (Bike Route). A signed route along a street where the bicyclist shares the right-of-way with motor vehicles. This facility can also be designated using a shared-lane marking (sharrow).



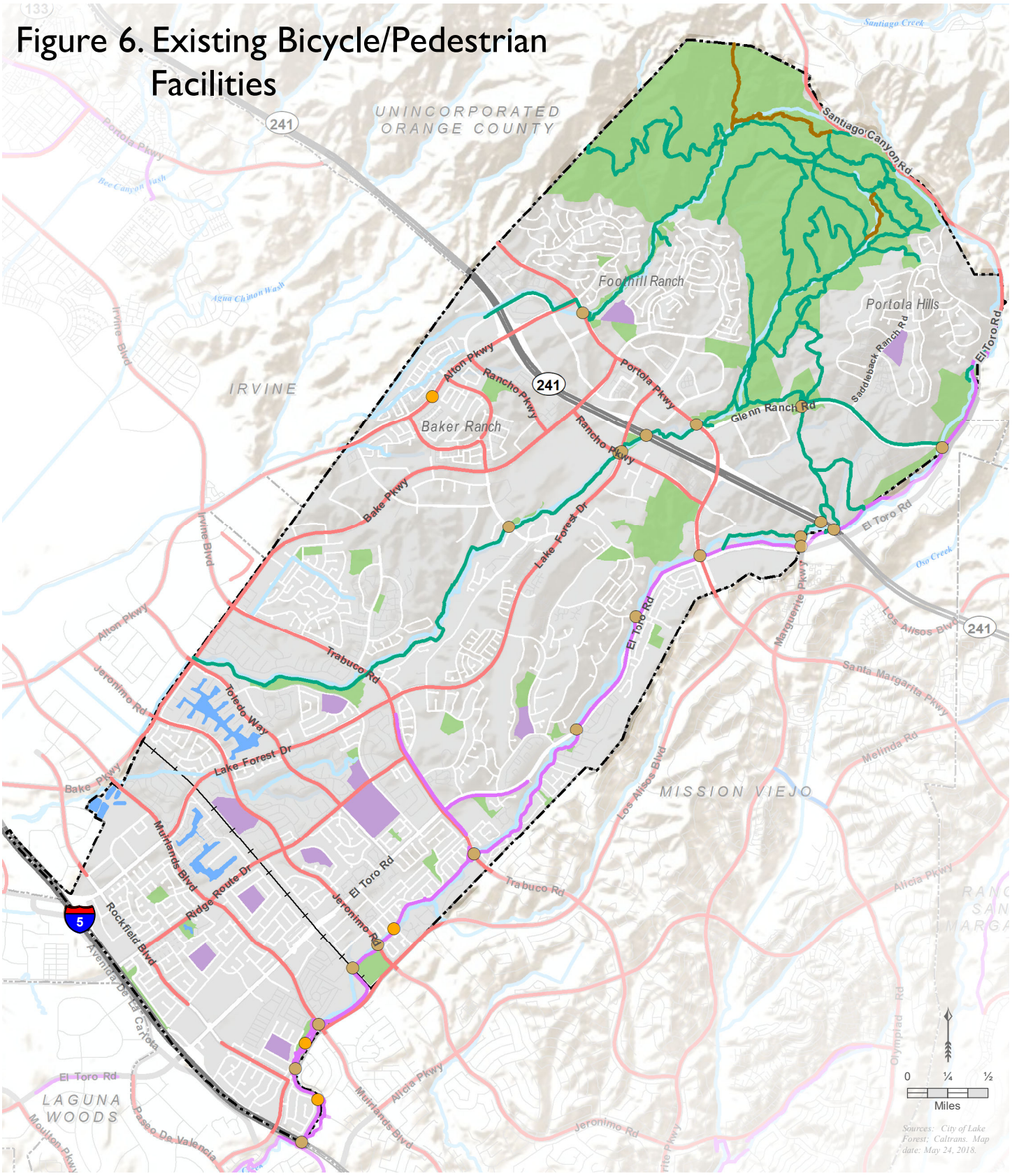
- Class IV Bikeway (Separated Bike Lane). A bikeway for the exclusive use of bicycles including a separation required between the separated bikeway and the through vehicular traffic. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.



As shown in Figure 6, the existing bicycle facilities in Lake Forest include:

- A Class I facility running along Aliso Creek between Santiago Canyon Road and Laguna Niguel.
- Class II bicycle lanes on the city's arterial roadways including Portola Parkway, Alton Parkway, Bake Parkway, Ridge Route Drive, Trabuco Road, Jeronimo Road, Muirlands Boulevard, Los Alisos Boulevard, and Rancho Parkway.
- Class II bicycle lanes on portions of the city's arterial roadways including Lake Forest Drive (Muirlands Boulevard to Portola Parkway), Toledo Way (Bake Parkway to Lake Forest Drive), and Rockfield Boulevard (Ridge Route Drive to Cavanaugh Road and El Toro Road to Los Alisos Boulevard.
- The Serrano Creek Trail, an unpaved multiuse trail running from Bake Parkway to El Toro Road.
- Several unpaved multiuse trails in the Foothill area, including the Borrego Trail.
- Non-motorized bridges and underpasses along the Aliso Creek bikeway, Serrano Creek Trail, and other paths and trails.

Figure 6. Existing Bicycle/Pedestrian Facilities



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Class I Bike Path
- Class II Bike Lanes
- Class III Bike Route
- Hiking-Only Trail
- Multi-Use Trail
- Bike/Pedestrian Bridge
- Bike/Pedestrian Underpass

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PEDESTRIAN CONDITIONS

Lake Forest offers several types of facilities and amenities that support walking in the city. The availability and quality of pedestrian facilities vary throughout the city and can be analyzed using seven key factors as shown in Table 5.

Table 5: Pedestrian Facility Conditions in Lake Forest

FACTOR	*DESCRIPTION*	*ASSESSMENT*
Sidewalk Availability	Sidewalk availability is core to supporting walkability and safety separating pedestrians from vehicles and other modes. In addition, it is important that sidewalks are present on both sides of the roadway and are available along the entire segment rather than end midblock.	Sidewalks are generally provided on both sides of arterial and local streets across the city. A small number of sidewalk coverage gaps exist, including at the Lake Forest Drive overpass at I-5, Ridge Route Drive railroad underpass, Trabuco Road bridge at Aliso Creek, and El Toro Road north of Trabuco Road.
Sidewalk Conditions	Cracked, broken, or otherwise damaged sidewalks can pose a safety hazard and discourage walking.	Sidewalks in the city are in good condition, free of cracks or uplifts.
Crosswalk Availability	Marked crosswalks can accommodate pedestrians that need to cross streets. A lack of marked crosswalks could hinder walkability since pedestrians need to travel greater distances to reach a marked crossing point. Drivers may also be less likely to yield to pedestrians at unmarked crossings.	Marked crosswalks are consistently provided at intersections across the city.
Shading	Shading, whether natural or artificial, can encourage walking in areas such as Southern California which are relatively warm with limited rainfall, especially in the summer.	Shading is provided across the city in the form of abundant tree landscaping along arterials and local residential streets.
Flat Grade	Steep hills and ravines can discourage walking, especially for pedestrians with limited mobility.	While there is a gradual elevation increase in the city heading northeast, the city is generally flat without steep grade changes at the pedestrian level. Locations with noticeable grade increases include the Bake Parkway and El Toro Road railroad overpasses, the Lake Forest Drive bridge at I-5, and Glenn Ranch Road.
Buffer	Buffers which provide separation between pedestrians and moving vehicles can help improve the walking experience, and can include landscaping, parked vehicles, and bulbouts, which serve to both reduce pedestrian crossing distances at intersections and as a traffic calming measure.	Within Lake Forest's residential neighborhoods, buffers consist of grass, other landscaping, and parallel parking. Along arterial roads, parking is generally prohibited, and bike lanes are sometimes present; arterial roads tend not to have street landscaping buffers.

FACTOR	*DESCRIPTION*	*ASSESSMENT*
Amenities	In addition to physical facilities that accommodate walking, useful or interesting amenities along sidewalks create a more interesting walking environment and increase pedestrian comfort. Amenities can include sidewalk-adjacent retail and restaurants, landscaping, and street furniture.	Within Lake Forest's residential neighborhoods, the primary amenity is street landscaping. Arterial roads offer few pedestrian-level amenities, especially given that retail in Lake Forest is generally not street-facing.

Source: Kittelson & Associates, Inc., 2019

In addition to on-street facilities, Lake Forest residents enjoy several off-road hiking-only and multiuse trails. These include the Serrano Creek Trail and other trails in the Foothill area, as shown in Figure 6. In addition, pedestrians using these trails are supported by several bicycle/pedestrian bridges and underpasses across the city.

FREIGHT/GOODS MOVEMENT

The Surface Transportation Assistance Act (STAA) of 1982 defines a network of state facilities as truck routes which accommodate large trucks. STAA-designated truck routes in Lake Forest consist of I-5 and SR-241. Other STAA-designated truck routes in proximity to Lake Forest include Interstate 405 (I-405), SR-133/Laguna Canyon Road, and SR-73. These truck routes are shown in Figure 7.

According to the current General Plan, trucks on local roads should be limited to arterial roadways. The City's Municipal Code prohibits vehicles exceeding a maximum gross weight of 14,000 pounds from using the following arterials and local roads in the city, displayed in Figure 7:[3]

- Canada Road - from Dimension Drive to Lake Forest Drive
- Osterman Road - from Pittsford Drive to Regency Lane
- Pittsford Drive - from Northcrest Drive to Lake Forest Drive
- Regency Lane - from Normandale Drive to Lake Forest Drive
- Normandale Drive - from El Toro Road to Osterman Road
- Aliso Park Drive - from El Toro Road to Midcrest Drive
- Northcrest Drive - from Midcrest Drive to El Toro Road
- Serrano Road - from Toledo Way to El Toro Road
- Toledo Way - from Bake Parkway to Lake Forest Drive
- Jeronimo Road - from Bake Parkway to Lake Forest Drive
- Muirlands Boulevard - from north City limits to Lake Forest Drive

[3] City of Lake Forest Municipal Code, 12.26.030

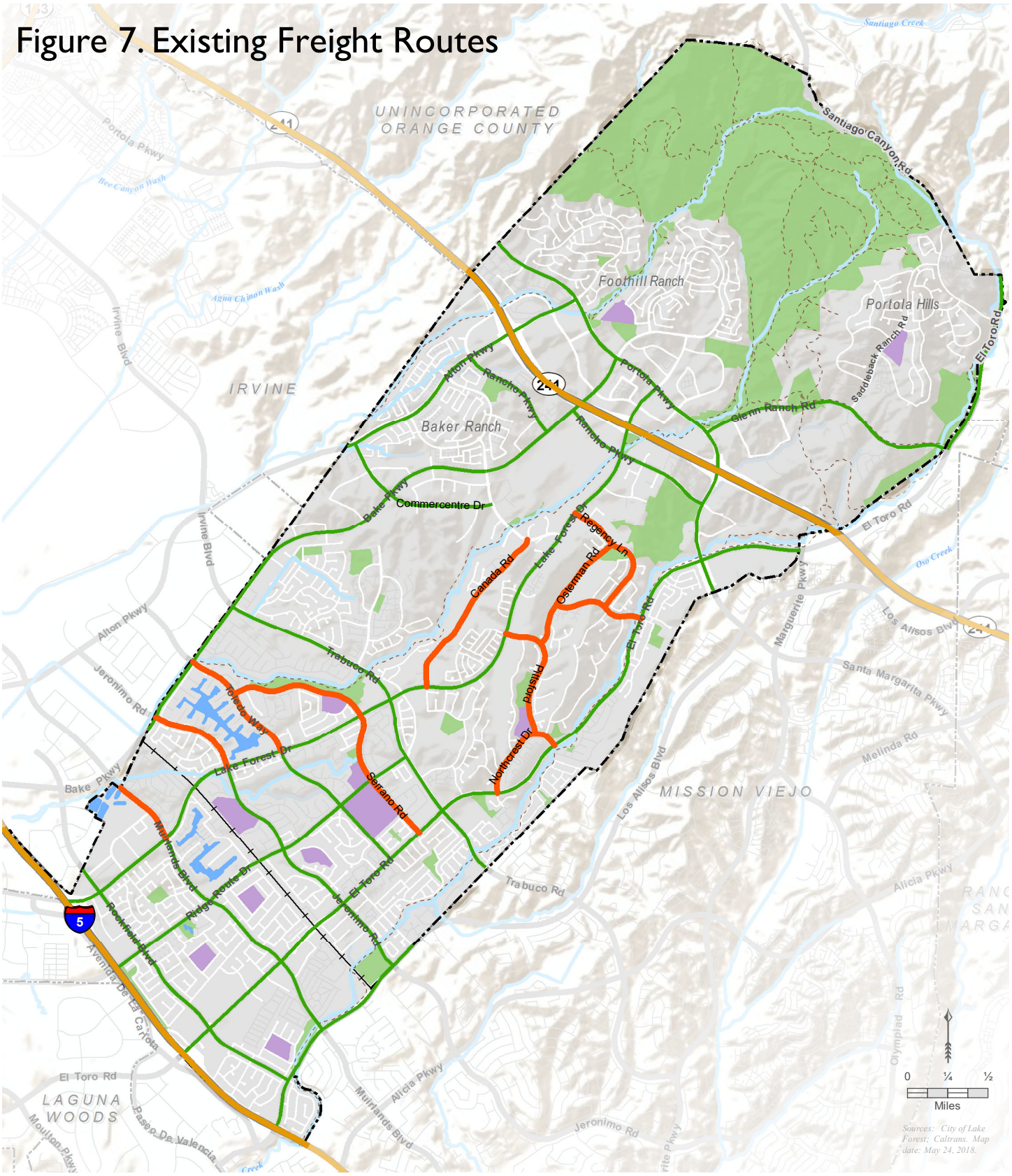
Additionally, goods movement in Lake Forest and the surrounding area is supported by the Topeka & Santa Fe Railroad which runs through the city between Muirlands Boulevard and Jeronimo Road. This is an important regional freight facility and is included in SCAG's main line rail network.[4]

AVIATION SYSTEM

John Wayne Airport, located approximately 10 miles northwest of Lake Forest and surrounded by the cities of Irvine, Newport Beach, and Costa Mesa, is a commercial airport serving passenger and cargo airplanes. The airport has two runways and is the third busiest airport in Southern California with over 10 million passengers in 2016. Lake Forest residents can directly access the airport using I-405, which connects to Lake Forest via I-5, SR-133, and SR-241. Other passenger airports in the region include Los Angeles International Airport, Long Beach Airport, Ontario International Airport, Hollywood Burbank Airport, and San Diego International Airport.

[4] Southern California Association of Governments, 2016-2040 RTP/SCS, June 2016.

Figure 7. Existing Freight Routes



Legend

- City of Lake Forest
- Other City Boundaries
- Public School
- City or County Park
- Riding & Hiking Trails
- State Highway Truck Network
- Local Arterial Roadways
- Trucks Prohibited
- Rail

Our Vision. Our Plan. Lake Forest 2040

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

EXISTING TRAFFIC CONDITIONS

Automobile operating conditions within the city are influenced by a variety of factors, including regional through traffic found along arterial routes and the network of local streets including the Loop. Driving conditions on the roadway network are measured through automobile Level of Service (LOS), which reflects motorists' and passengers' perceptions of traffic conditions. The following documents the LOS perceived by motorists traveling throughout the city today.

Level of Service Methodologies and Standards

Study intersections, including locations in Laguna Hills, were analyzed using the Intersection Capacity Utilization (ICU) methodology, consistent with Lake Forest[5] and Laguna Hills[6] LOS guidelines. Under the ICU methodology, the critical movement and critical movement capacity of an intersection are used to calculate a volume-to-capacity (V/C) ratio. After the V/C ratio is calculated, the ICU methodology assigns an LOS grade (A to F) representing the quality of intersection operations, with LOS F signifying volumes exceeding capacity. LOS grades and corresponding V/C ratios under the ICU methodology are provide in Table 6. The maximum acceptable level of service for Lake Forest and Laguna Hills intersections is LOS D.

For the ICU analysis, the following assumptions were utilized:

- Saturation Flow Rate: 1,700 vehicles/hour/lane
- Clearance Interval: 0.05
- Right-Turn-On-Red Utilization Factor: 0.75
- "De-facto" right-turn lane assumed in the ICU calculation if 19 feet from edge to outside of through-lane exists and parking is prohibited during peak periods.

Orange County CMP intersections were also analyzed using the ICU methodology.[7] The maximum acceptable level of service under this analysis is LOS E.

Table 6: Intersection Level of Service and V/C Ratios (ICU Methodology)

LOS	Volume to Capacity Ratio
A	Less than 0.61
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	Greater than 1.00

Source: Orange County Transportation Authority, *Congestion Management Program Preparation Manual*, 2011

[5] City of Lake Forest, CEQA Significance Thresholds Guide, November 2001.
[6] City of Laguna Hills, Traffic Study Guidelines, August 2010.
[7] Orange County Transportation Authority, Congestion Management Program Preparation Manual, April 2011.

Caltrans freeway ramp intersections were also analyzed using the Highway Capacity (HCM) methodology. The HCM methodology assigns a level of service grade to an intersection based on the average control delay for vehicles at the intersection, ranging from LOS A to LOS F; LOS A signifies very slight delay with no approach phase fully utilized while LOS F signifies very high delays and congestion, frequent cycle failures, and long queues. LOS C is the maximum acceptable level of service for Caltrans intersections under the HCM methodology.[8] LOS grades and corresponding delay values under the HCM methodology are provided in Table 7. A saturation flow rate of 1,900 vehicles/hour/lane was utilized.

Table 7: Intersection Level of Service and Delay Thresholds (HCM Methodology)

Average Delay Per Vehicle (Seconds)		LOS
Signalized	Unsignalized	
≤10.0	≤10.0	A
>10.0 and ≤20.0	>10.0 and ≤15.0	B
>20.0 and ≤35.0	>15.0 and ≤25.0	C
>35.0 and ≤55.0	>25.0 and ≤35.0	D
>55.0 and ≤80.0	>35.0 and ≤50.0	E
>80.0	>50.0	F

Source: Transportation Research Board, *Highway Capacity Manual*, Washington, D.C., 2018

Operations on roadway segments were analyzed on a daily traffic volume basis. Operations were assessed and assigned a level of service (LOS) letter grade ranging from LOS A to LOS F (from better to worse congestion), with LOS A signifying free-flow traffic and LOS F signifying operations that are over roadway capacity. The roadway segment LOS thresholds used in this analysis are shown in Table 8. These thresholds are derived from representative roadway capacities in the OCTA Master Plan of Arterial Highways (MPAH) Guidelines and are defined by the number of lanes and the presence of a median or divider. Daily capacities for roadways with asymmetric capacity (e.g., seven lanes) were interpolated based on the capacities displayed in Table 8. For this analysis, LOS D was used as the roadway segment LOS standard.

Table 8: Daily Roadway Capacity Values for Arterial Level of Service

Roadway Type	LOS A	LOS B	LOS C	LOS D	LOS E
8 Lanes Divided	45,000	52,500	60,000	67,500	75,000
6 Lanes Divided	33,750	39,375	45,000	50,625	56,250
4 Lanes Divided	22,500	26,250	30,000	33,750	37,500
4 Lanes Undivided	15,000	17,500	20,000	22,500	25,000

Source: Kittelson & Associates, Inc., 2019

[8] Caltrans, Guide for the Preparation of Traffic Impact Studies, December 2002.

Existing Levels of Service

Weekday AM and PM peak hour level of service for the 48 study intersections are shown in Table 9. Data in **bold** indicate unacceptable level of service (per each criteria). Existing AM & PM peak hour intersection traffic volumes and lane geometries are shown in Figure 8.

The following intersection currently operates with unacceptable LOS during the weekday AM and/or PM peak hour under the ICU methodology under City of Lake Forest standards:

- #22 – Bake Parkway & Jeronimo Road (LOS E in the weekday AM peak hour)

In addition, under the HCM methodology, the following Caltrans freeway ramp intersections currently operate with unacceptable LOS during the weekday AM and/or PM peak hour:

- #37 – Paseo De Valencia & Avenida De La Carlota (LOS D in the weekday AM and PM peak hours)
- #38 – El Toro Road & Bridger Road/I-5 NB Ramps (LOS D in the weekday PM peak hour)

All three CMP study intersections operate acceptably under CMP standards (LOS E or better).

Table 9: Existing (2018) Intersection Level of Service – Weekday AM/PM Peak Hours

Intersection		AM Peak Hour		PM Peak Hour	
		V/C (Delay)	LOS	V/C (Delay)	LOS
1	Alton Parkway & Portola Parkway	0.41	A	0.30	A
2	Bake Parkway & Portola Parkway	0.45	A	0.51	A
3	Lake Forest Drive & Portola Parkway	0.44	A	0.43	A
4	Glenn Ranch Road & Portola Parkway	0.36	A	0.47	A
5	Portola Parkway & SR-241 Ramps	0.38 (23.8)	A (C)	0.39 (21.5)	A (C)
6	Alton Parkway & SR-241 Ramps	0.41 (24.6)	A (C)	0.37 (21.6)	A (C)
7	Lake Forest Drive & SR-241 NB On-Ramp	0.23 (4.0)	A (A)	0.26 (3.7)	A (A)
8	Lake Forest Drive & SR-241 SB Off-Ramp	0.28 (7.9)	A (A)	0.30 (6.0)	A (A)
9	Bake Parkway & Rancho Parkway	0.47	A	0.59	A
10	Lake Forest Drive & Rancho Parkway	0.45	A	0.59	A
11	Bake Parkway & Rancho Parkway South	0.55	A	0.53	A
12	El Toro Road & Portola Parkway/Santa Margarita Parkway	0.61	B	0.68	B
13	Bake Parkway & Commercentre Drive	0.47	A	0.47	A
14	Bake Parkway & Irvine Boulevard/Trabuco Road	0.65	B	0.68	B
15	Lake Forest Drive & Trabuco Road	0.58	A	0.58	A
16	Ridge Route Drive & Trabuco Road	0.43	A	0.50	A

Intersection		AM Peak Hour		PM Peak Hour	
		V/C (Delay)	LOS	V/C (Delay)	LOS
17	El Toro Road & Trabuco Road	0.62	B	0.60	A
18	Bake Parkway & Toledo Way	0.73	C	0.57	A
19	Lake Forest Drive & Toledo Way	0.53	A	0.53	A
20	Ridge Route Drive & Toledo Way	0.33	A	0.27	A
21	El Toro Road & Toledo Way	0.53	A	0.44	A
22	Bake Parkway & Jeronimo Road	**0.92**	**E**	0.74	C
23	Lake Forest Drive & Jeronimo Road	0.64	B	0.72	C
24	Ridge Route Drive & Jeronimo Road	0.47	A	0.46	A
25	El Toro Road & Jeronimo Road	0.66	B	0.81	D
26	Los Alisos Boulevard & Jeronimo Road	0.65	B	0.66	B
27	Lake Forest Drive & Muirlands Boulevard	0.49	A	0.70	B
28	Ridge Route Drive & Muirlands Boulevard	0.42	A	0.54	A
29	El Toro Road & Muirlands Boulevard	0.61	B	0.70	B
30	Los Alisos Boulevard & Muirlands Boulevard	0.68	B	0.70	B
31	Lake Forest Drive & Rockfield Boulevard	0.55	A	0.66	B
32	Ridge Route Drive & Rockfield Boulevard	0.35	A	0.45	A
33	El Toro Road & Rockfield Boulevard	0.56	A	0.61	B
34	Los Alisos Boulevard & Rockfield Boulevard	0.69	B	0.54	A
35	Lake Forest Drive & I-5 NB Ramps	0.42 (11.4)	A (B)	0.47 (31.0)	A (C)
36	Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota	0.46 (25.2)	A (C)	0.78 (28)	C (C)
37	Paseo De Valencia & Avenida De La Carlota	0.48 **(43.1)**	A **(D)**	0.51 **(41.3)**	A **(D)**
38	El Toro Road & Bridger Road/I-5 NB Ramps	0.63 (21.4)	B (C)	0.66 **(41.4)**	B **(D)**
39	El Toro Road & Avenida De La Carlota	0.37	A	0.56	A
40	Portola Parkway & Rancho Parkway	0.46	A	0.58	A
41	Alton Parkway & Rancho Parkway South	0.46	A	0.40	A
42	Alton Parkway & Commercentre	0.42	A	0.52	A
51	El Toro Road & Glenn Ranch Road	0.47	A	0.58	A
56	Bake Parkway & Dimension Drive	0.44	A	0.59	A
57	Lake Forest Drive & Dimension Drive	0.34	A	0.48	A
60	Dimension Drive & Commercentre Drive	0.39	A	0.53	A
101	Lake Forest Drive & Pittsford Drive	0.59	A	0.42	A
102	El Toro Road & Northcrest Drive	0.42	A	0.45	A

Note: **Bold** signifies unacceptable level of service.
Source: Kittelson & Associates, Inc., 2019

Table 10 provides the study roadway segments, existing daily volumes, and the resulting levels of service. Data in **bold** indicate roadway segments that currently operate at unacceptable levels of service.

Under existing conditions, Lake Forest Drive (West of Rockfield Boulevard) performs unacceptably at LOS F.

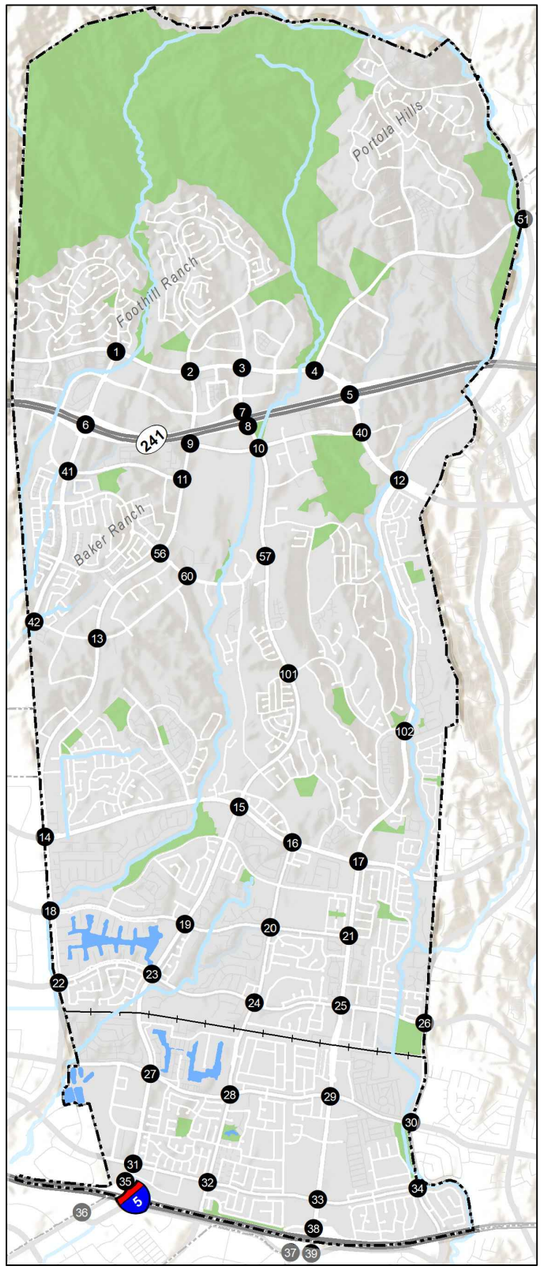
Table 10: Existing (2018) Roadway Segment Level of Service

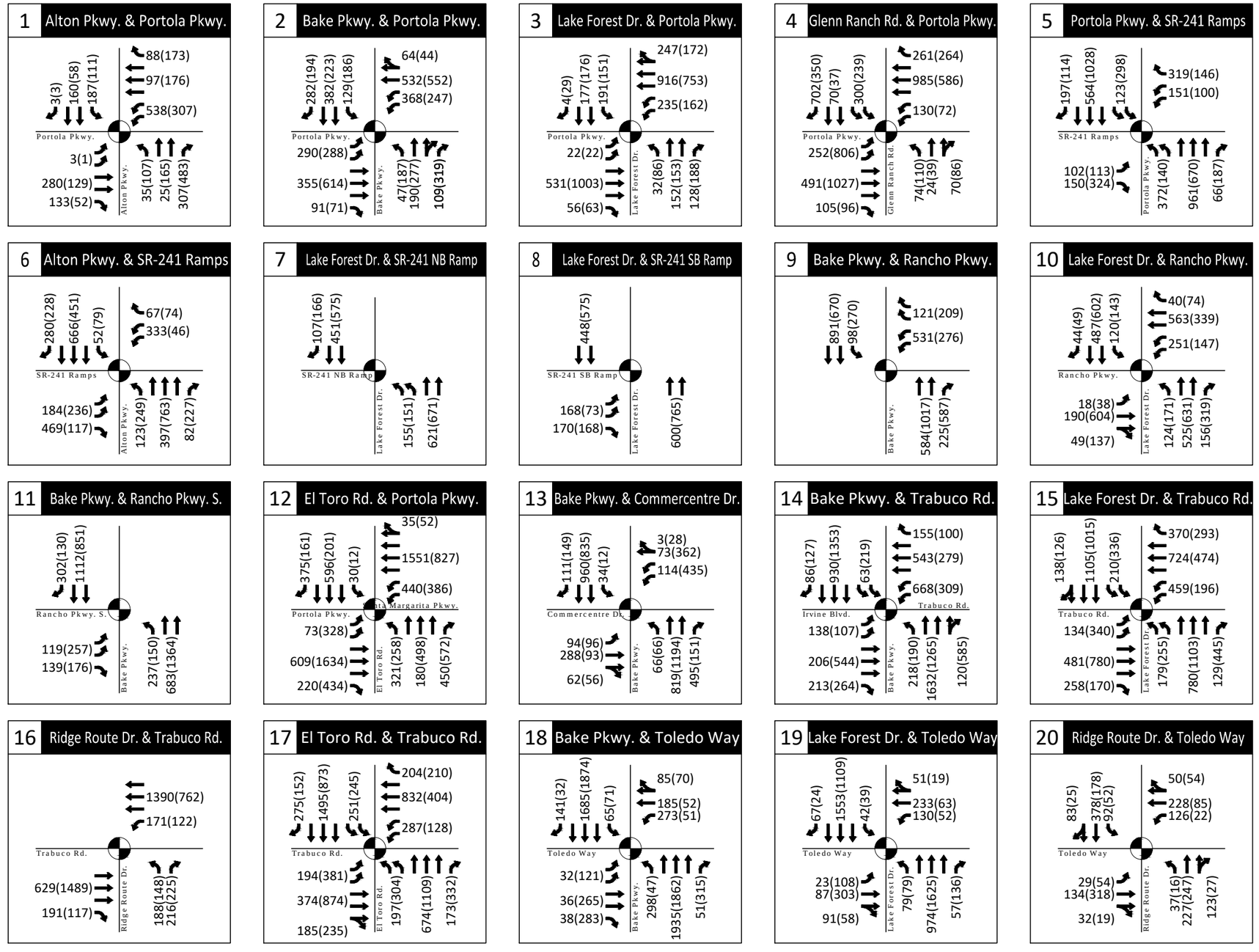
Roadway	Segment	Roadway Type[1]	ADT[2]	LOS
Trabuco Road	North of Lake Forest Drive	6D	21,535	A
	North of Ridge Route Drive	6D	22,336	A
	North of El Toro Road	6D	25,107	A
	South of El Toro Road	4D	21,730	A
Toledo Way	North of Lake Forest Drive	4D	6,063	A
	South of Lake Forest Drive	4U	5,812	A
	South of Ridge Route Drive	4D	5,985	A
Jeronimo Road	North of Lake Forest Drive	4D	13,482	A
	North of Ridge Route Drive	4U	13,349	A
	North of El Toro Road	4D	14,359	A
	South of El Toro Road	4D	21,648	A
Muirlands Boulevard	North of Lake Forest Drive	4D	13,936	A
	North of Ridge Route Drive	4D	17,180	A
	South of Ridge Route Drive	4D	19,578	A
	South of El Toro Road	4D	20,709	A
Rockfield Boulevard	North of Lake Forest Drive	4D	21,911	A
	North of Ridge Route Drive	4D	17,549	A
	North of El Toro Road	4D	18,642	A
	North of Los Alisos Boulevard	4D	13,707	A
Portola Parkway	North of Alton Parkway	4D	5,976	A
	North of Bake Parkway	5D	17,526	A
	North of Lake Forest Drive	5D	23,677	A
	North of Glenn Ranch Road	6D	32,283	A
	North of SR-241	6D	25,325	A
	South of SR-241	6D	27,477	A
	North of El Toro Road	6D	35,739	B
	South of El Toro Road	7D	37,996	A
Rancho Parkway South	North of Bake Parkway	4D	7,400	A
Rancho Parkway	South of Bake Parkway	4D	13,914	A
	South of Lake Forest Drive	4D	19,440	A
Glenn Ranch Road	Portola Parkway to Saddleback Ranch Road	4D	16,076	A
	Saddleback Ranch Road to El Toro Road	4D	6,849	A
Alton Parkway	West of Portola Parkway	6D	13,231	A

Roadway	Segment	Roadway Type[1]	ADT[2]	LOS
	West of SR-241	6D	19,122	A
	West of Rancho Parkway South	6D	23,261	A
	East of Trabuco Road	6D	24,382	A
Bake Parkway	West of Towne Center Drive	4D	26,318	B
	East of Commercentre Drive	4D	29,630	C
	West of Commercentre Drive	4D	32,335	D
	West of Trabuco Road	6D	46,162	D
	West of Toledo Way	6D	49,268	D
Lake Forest Drive	West of Portola Parkway	4D	9,502	A
	East of Rancho Parkway	4D	18,493	A
	West of Rancho Parkway	4D	20,894	A
	East of Trabuco Road	4D	31,667	D
	West of Trabuco Road	6D	31,178	A
	East of Jeronimo Road	6D	33,027	A
	East of Muirlands Boulevard	6D	32,627	A
	West of Muirlands Boulevard	6D	36,011	B
	West of Rockfield Boulevard	6D	**59,276**	**F**
Ridge Route Drive	East of Toledo Way	4D	6,666	A
	East of Jeronimo Road	4U	7,428	A
	West of Jeronimo Road	2D	7,689	A
	East of Muirlands Boulevard	4D	6,886	A
	East of Rockfield Boulevard	4D	6,811	A
	West of Rockfield Boulevard	4D	2,524	A
El Toro Road	East of Glenn Ranch Road	3D	13,969	A
	West of Glenn Ranch Road	3D	14,800	A
	East of Santa Margarita Parkway	5D	13,832	A
	West of Santa Margarita Parkway	6D	25,322	A
	East of Trabuco Road	5D	31,358	B
	West of Trabuco Road	6D	35,784	B
	East of Jeronimo Road	6D	38,539	B
	East of Muirlands Boulevard	6D	40,733	C
	West of Muirlands Boulevard	8D	44,716	A
	West of Rockfield Boulevard	9D	54,028	B
Los Alisos Boulevard	East of Jeronimo Road	6D	28,974	A
	East of Muirlands Boulevard	6D	30,001	A
	West of Muirlands Boulevard	6D	27,284	A
	West of Rockfield Boulevard	4D	25,047	B
Commercentre Drive	South of Alton Parkway	4D	7,546	A
	South of Bake Parkway	4D	11,085	A
	North of Dimension Drive	4D	7,896	A

Roadway	Segment	Roadway Type[1]	ADT[2]	LOS
Dimension Drive	North of Commercentre Drive	4D	5,963	A
	South of Commercentre Drive	4D	12,021	A

Note: **Bold** signifies unacceptable level of service.
1. Roadway type refers to number of lanes and divided (D) or undivided (U)
2. ADT denotes Average Daily Traffic
Source: Kittelson & Associates, Inc., 2019





AM(PM) - Traffic Volume

- Traffic Signal

Existing Intersection Volumes and Geometries
Lake Forest, CA

Figure
8

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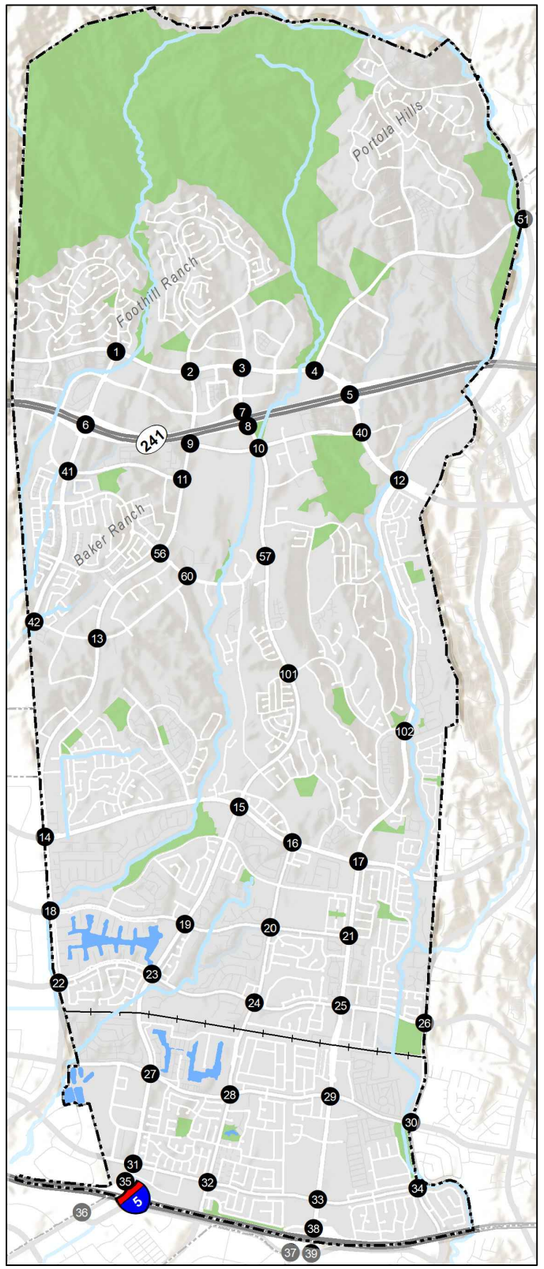

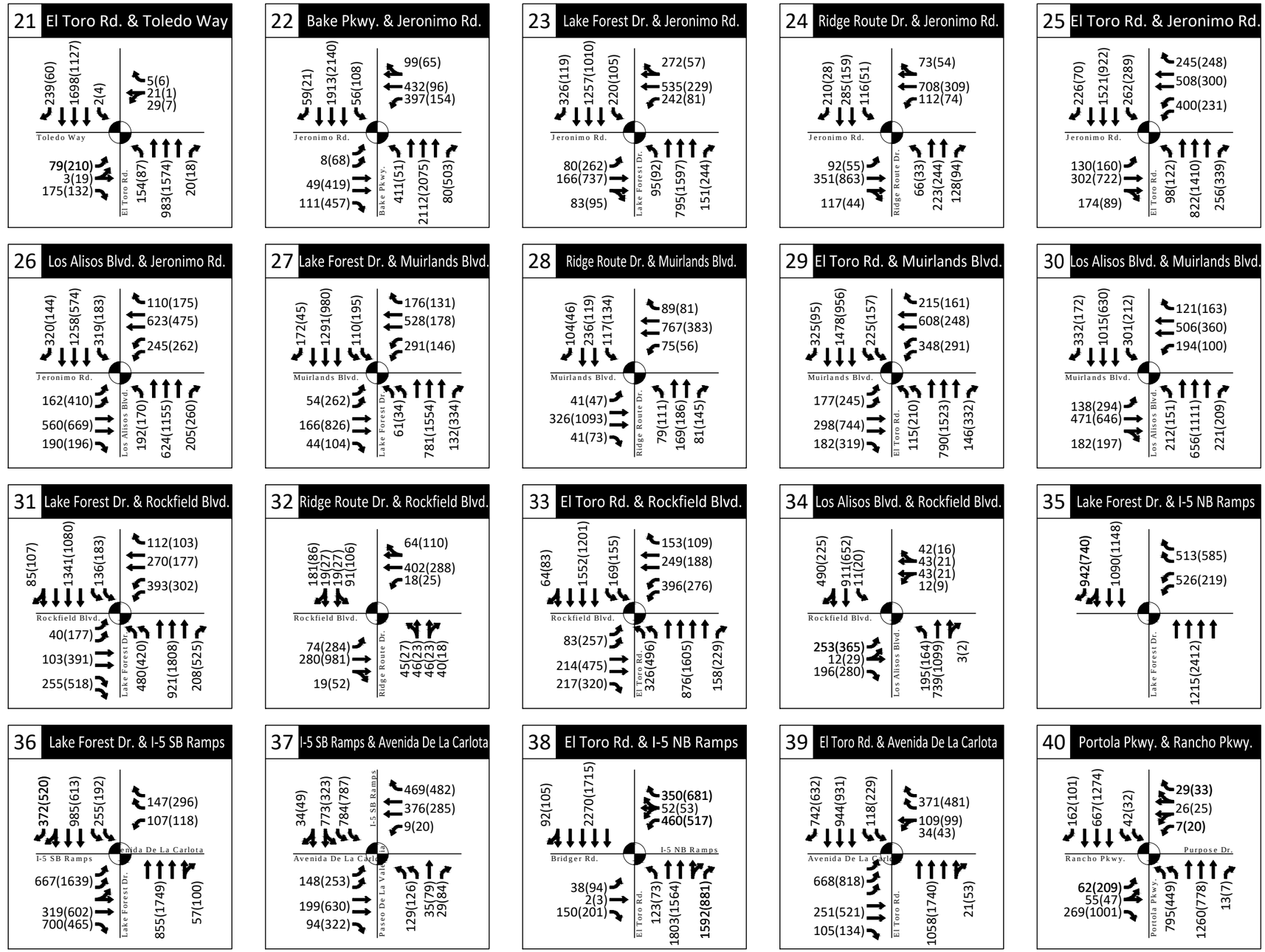

AM(PM) - Traffic Volume

- Traffic Signal

Existing Intersection Volumes and Geometries
Lake Forest, CA

Figure
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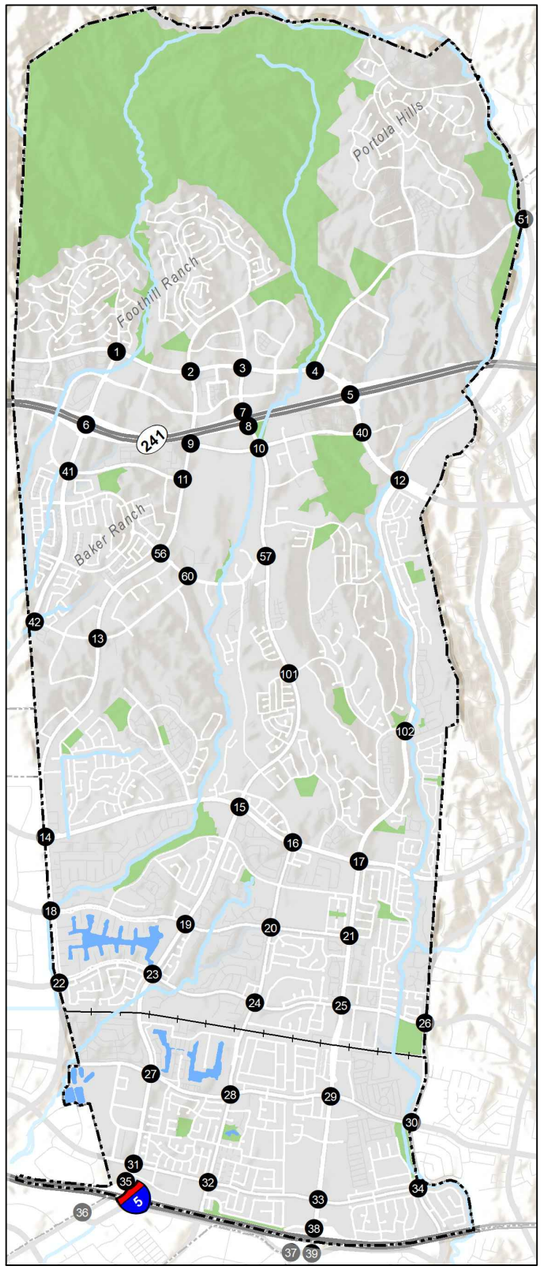

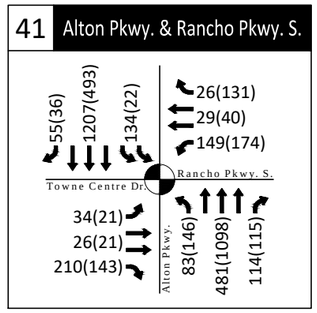

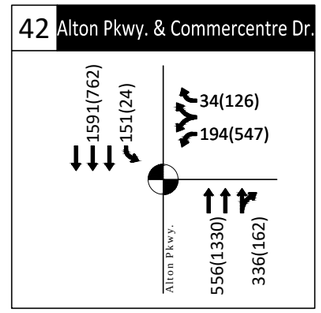

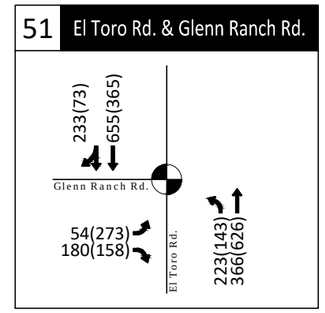

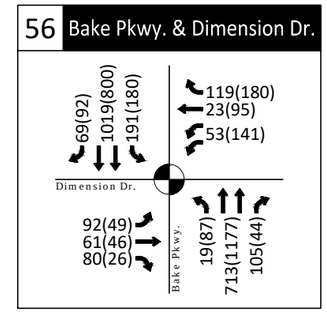

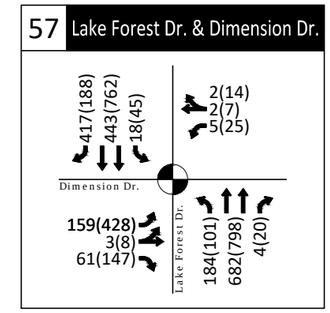

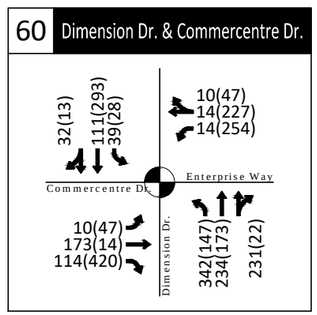

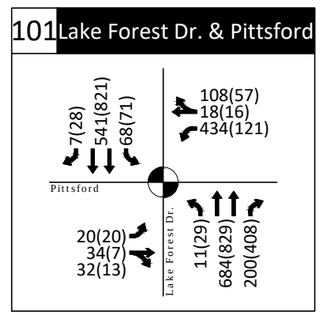

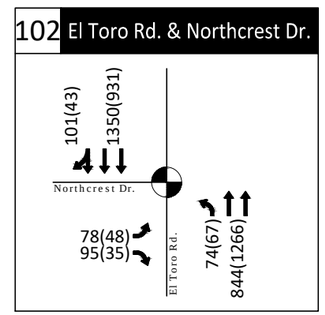

AM(PM) - Traffic Volume

- Traffic Signal

Existing Intersection Volumes and Geometries
Lake Forest, CA

Figure
8

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Section 4 Regulatory Setting

REGULATORY SETTING

This section summarizes applicable federal, state, regional and local plans pertinent to the City of Lake Forest and the California Environmental Quality Act (CEQA) review process for transportation and circulation. This information provides a context for the impact discussion related to the General Plan Update's consistency with applicable policies, plans, laws and regulations.

FEDERAL

Americans with Disabilities Act

The Americans with Disabilities Act of 1990 (ADA) provides comprehensive rights and protections to individuals with disabilities. The goal of the ADA is to assure equality of opportunity, full participation, independent living and economic self-sufficiency. To implement this goal, the United States Access Board has created accessibility guidelines for public rights-of-way. The guidelines address various issues, including roadway design practices, slope and terrain issues, pedestrian access to streets, sidewalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way.

The City of Lake Forest is committed to ensure that people with disabilities have access to City programs, services, activities and facilities. In all of its services, programs, events, activities, facilities, and public meetings, the City strives to eliminate any barriers that prohibit people with disabilities from full access to facilities.

Federal Highway Administration

The Federal Highway Administration (FHWA) is a federal agency that focuses on national highway programs. FHWA administers and manages federal highway programs and establishes national standards. The FHWA publishes the Manual on Uniform Traffic Control Devices (MUTCD) which specifies the standards for street markings, traffic signals, and street signs in the United States. The California Department of Transportation (Caltrans) developed the California MUTCD based on the FHWA MUTCD.

STATE

California Department of Transportation

Caltrans is the primary state agency responsible for transportation issues. One of its duties is the construction and maintenance of the state highway system. Caltrans has established standards for roadway traffic flow and developed procedures to determine if State-controlled facilities require improvements. For projects that may physically affect facilities or require access to a state highway, Caltrans requires encroachment permits before such activity may be undertaken. For projects that would

not physically affect facilities but may influence traffic flow and levels of services at such facilities, Caltrans may recommend measures to mitigate the traffic impacts of such projects.

Additionally, the following Caltrans procedures and directives are relevant to transportation improvements in Lake Forest:

- **Level of Service Target**. Caltrans maintains a target level of service at the transition between level of service (LOS) C and LOS D for all of its facilities. Where an existing facility is operating at less than the LOS C/D threshold, the existing measure of effectiveness should be maintained.
- **Caltrans Project Development Procedures Manual**. This manual outlines pertinent statutory requirements, planning policies, and implementing procedures regarding transportation facilities. It is continually and incrementally updated to reflect changes in policy and procedures. For example, the most recent revision incorporates the Complete Streets policy from Deputy Directive 64-R1, which is detailed below.
- **Caltrans Deputy Directive 64 (2001)**. This directive requires Caltrans to consider the needs of non-motorized travelers, including pedestrians, bicyclists, and persons with disabilities, in all programming, planning, maintenance, construction, operations, and project development activities and products. This includes incorporation of the best available standards in all of the Department's practices.
- **Caltrans Deputy Directive 64-R1 (2014)**. This directive requires Caltrans to provide for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the state highway system. Caltrans supports bicycle, pedestrian, and transit travel with a focus on "complete streets" that begins early in system planning and continues through project construction and maintenance and operations.
- **Caltrans Director's Policy 22 (2001)**. This policy establishes support for balancing transportation needs with community goals. Caltrans seeks to involve and integrate community goals in the planning, design, construction, and maintenance and operations processes, including accommodating the needs of bicyclists and pedestrians.
- **Environmental Assessment Review and Comment**. Caltrans, as a responsible agency under the California Environmental Quality Act (CEQA), is available for early consultation on a project to provide guidance on applicable transportation analysis methodologies or other transportation related issues and is responsible for reviewing the traffic impact study for errors and omissions pertaining to the state highway facilities. Caltrans published the Guide for the Preparation of Traffic Impact Studies (December 2002), which established the Measures of Effectiveness as described under "Level of Service Target" above. The Measures of Effectiveness is used to determine significant impact on state facilities. The Guide also mandates that the traffic analysis includes mitigation measures to lessen the potential project impacts on state facilities and the project's fair share responsibility for the impacts. However, the ultimate mitigation measures and their implementations are to be determined upon consultation between Caltrans, the City and the project proponent.

OPR General Plan Guidelines

The Governor's Office of Planning and Research (OPR) publishes General Plan Guidelines as a "how to" for cities and counties developing their general plans. OPR released its updated guidelines in 2017, which includes legislative changes, new guidance, policy recommendations, external links to resource documents, and additional resources. For each general plan element, the guidelines discuss statutory requirements in detail, provide recommended policy language, and include examples of city and county general plans that have adopted similar policies.

Assembly Bill 32, Senate Bill 32 and Senate Bill 375

Assembly Bill (AB) 32, also known as the Global Warming Solutions Act of 2006, committed California to reducing greenhouse gas (GHG) emissions to 1990 levels by 2020. The California Air Resources Board (ARB), which is coordinating the response to comply with AB 32, is currently on schedule to meet this deadline. In 2016, Senate Bill (SB) 32 added a new target: reducing statewide emissions to 40 percent below 1990 levels by 2030.

SB 375 provides guidance for curbing emissions from cars and light trucks to help California comply with AB 32. There are five major components to SB 375:

- ARB will guide the adoption of GHG emission targets to be met by each Metropolitan Planning Organization (MPO) in the state.
- MPOs are required to create a Sustainable Communities Strategy (SCS) that provides a plan for meeting these regional targets. The SCS must be consistent with the Regional Transportation Plan (RTP).
- Regional housing elements and transportation plans must be synchronized on eight-year schedules. Also, the SCS and Regional Housing Needs Assessment (RHNA) must be consistent with each other.
- CEQA is streamlined for preferred development types such as mixed-use projects and transit-oriented developments (TODs) if they meet specific requirements.
- MPOs must use transportation and air emission modeling methodologies consistent with California Transportation Commission (CTC) guidelines.

California Complete Streets Act of 2008 (AB 1358)

Originally passed in 2008, California's Complete Streets Act took effect in 2011 and requires local jurisdictions to plan for land use transportation policies that reflect a "complete streets" approach to mobility. "Complete streets" comprises a suite of policies and street design guidelines which provide for the needs of all road users, including pedestrians, bicyclists, transit operators and riders, children, the elderly, and the disabled. From 2011 onward, any local jurisdiction—county or city—that undertakes a substantive update of the circulation element of its general plan must consider "complete streets" and incorporate corresponding policies and programs. In 2010, OPR released guidelines for compliance with

this legislation which provide direction on how circulation elements can best plan for a variety of travel modes such as transit, walking, bicycling, and freight.

Senate Bill 743

On September 27, 2013, Senate Bill (SB) 743 was signed into law.[9] The Legislature found that with the adoption of the Sustainable Communities and Climate Protection Act of 2008 (SB 375), the State had signaled its commitment to encourage land use and transportation planning decisions and investments that reduce vehicle miles traveled (VMT) and thereby contribute to the reduction of greenhouse gas emissions (GHG), as required by the California Global Warming Solutions Act of 2006 (AB 32). Additionally, the Complete Streets Act (AB 1358), requires local governments to plan for a balanced, multimodal transportation network that meets the needs of all users. To further the State's commitment to the goals of SB 375, AB 32 and AB 1358, SB 743 adds Chapter 2.7, Modernization of Transportation Analysis for Transit-Oriented Infill Projects, to Division 13 (Section 21099) of the Public Resources Code.

SB 743 started a process that could fundamentally change transportation impact analysis as part of CEQA compliance. These changes will include the elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts in many parts of California (if not statewide). Further, parking impacts will not be considered significant impacts on the environment for select development projects within infill areas with nearby frequent transit service. SB 743 includes amendments that revises the definition of "in-fill opportunity zones" to allow cities and counties to opt out of traditional LOS standards established by congestion management programs (CMPs) and requires OPR to update the CEQA Guidelines and establish "criteria for determining the significance of transportation impacts of projects within transit priority areas.[10] As part of the new CEQA Guidelines, the new criteria "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." OPR presented alternative metrics in a preliminary discussion draft in summer of 2014 and released a final advisory in December 2018. Key guidance includes:

- VMT is the most appropriate metric to evaluate a project's transportation impact.
- OPR recommends tour- and trip-based travel models to estimate VMT, but ultimately defers to local agencies to determine the appropriate tools.
- OPR recommends measuring VMT for residential and office projects on a "per rate" basis. Specifically, OPR recommends VMT per capita for residential projects and VMT per employee for office projects.

[9] An act to amend Sections 65088.1 and 65088.4 of the Government Code, and to amend Sections 21181, 21183, 21186, 21187, 21189.1, and 21189.3 of, to add Section 21155.4 to, to add Chapter 2.7 (commencing with Section 21099) to Division 13 of, to add and repeal Section 21168.6.6 of, and to repeal and add Section 21185 of, the Public Resources Code, relating to environmental quality.

[10] A "transit priority area" is defined in as an area within one-half mile of an existing or planned major transit stop. A "major transit stop" is defined in Public Resources Code Section 21064.3 as a rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods.

- OPR's recommended impact threshold for residential and office projects is VMT per capita fifteen percent below the city or regional average (whichever is applied). In other words, an office project that generates VMT per employee that is more than 85 percent of the regional VMT per employee could result in a significant impact. This threshold is in line with statewide greenhouse gas emission reduction targets.
- For retail projects, OPR recommends measuring the net decrease or increase in VMT in the study area with and without the project. The recommended impact threshold is any increase in total VMT.
- Lead agencies ultimately have the discretion to set or apply their own significance thresholds, provided they are based on significant evidence.
- Cities and counties still have the ability to use metrics such as LOS for other plans, studies, or network monitoring. However, LOS and similar metrics cannot constitute the sole basis for CEQA impacts.

SB 743-compliant CEQA analysis will become mandatory on July 1, 2020.

Assembly Bill 417

In October 2013, AB 417 created a statutory CEQA exemption for bicycle plans in urbanized areas. Before the passage of this bill, cities and counties that prepared bicycle plans were required to carry out a CEQA review. AB 417 exempts the following types of bicycle projects in an urbanized area:

- Restriping of streets and highways
- Bicycle parking and storage
- Signal timing to improve intersection operations
- Signage for bicycles, pedestrians, and vehicles

However, not all bicycle plans are exempt if certain conditions are met (e.g., a new Class I bicycle trail through a sensitive natural area).

REGIONAL

Southern California Association of Governments (SCAG)

SCAG is a federally designated MPO and is made up of six counties and 191 cities. SCAG develops long-range regional transportation plans including sustainable communities strategies and growth forecast components, regional transportation improvement programs, regional housing needs allocations, and a portion of the South Coast Air Quality Management Plans.

SCAG approved its most-recent Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) in April 2016, which outlines the long-range vision and the region's transportation system investments through 2040.

Orange County Transportation Authority (OCTA)

The Orange County Transportation Authority (OCTA) coordinates transportation planning efforts throughout Orange County and programs funding for project implementation. Additionally, it prepares the Congestion Management Program (CMP), a plan mandated by California law to describe the strategies to address congestion problems on the CMP network, which includes State highways and principal arterials. The CMP Guidelines require analysis of the CMP network and uses level of service standards as a means to measure congestion and to determine how local governments meet CMP standards. OCTA also administers the Master Plan of Arterial Highways (MPAH), which was established in 1956 to ensure that the county's regional highway network would be planned, developed, and preserved in order to supplement the freeway system. The MPAH defines the intended functions and carrying capacities of regional roads in the county. In order to be eligible for Measure M2 funding, a city's General Plan Circulation Element must be consistent with the MPAH; specifically, local circulation elements must maintain an equivalent number of minimum through lanes on each arterial highway that is included as part of the MPAH.

OCTA's Long Range Transportation Plan (LRTP) is a long-range policy document that assesses the county's transportation system over a 20-year horizon and identifies the projects that best address future population, housing, and employment needs. The most recent LRTP was finalized in September 2014 and outlines a vision of multimodal transportation improvements in the county to meet expected demand through 2035, including expanding system choices, improving performance, improving multimodal integration, and ensuring financial sustainability. The 2014 – 2019 OCTA Strategic Plan aims to address the county's short-term (five year) transportation needs and facilitates ongoing planning and implementation within OCTA. The Strategic Plan also sets out OCTA's principals and goals for guiding decision-making and planning.

OCTA also provides bus transit and paratransit services within Orange County, as well as to Los Angeles and Riverside. The OC Transit Vision, published in January 2018, is OCTA's transit-specific master plan that aims to improve transit service for the next 20 years. The plan looks at long-term transit needs, including bus, rail, paratransit, and new types of transportation services and technologies. The plan also identifies the corridors within the county with the highest expected demand and assesses which modes would be appropriate to meet that demand, such as streetcars, bus rapid transit (BRT), or other emerging modes.

OC Active, initiated in March 2017 and currently ongoing, is OCTA's Bike and Pedestrian Plan. The plan's primary goal is to recognize the areas and opportunities for active transportation across the county. The OC Active goals include advancing the strategic walking and biking network, enhancing walking and biking access to transit, improving high-need pedestrian areas, reducing pedestrian and bicyclist collisions, and leveraging funding opportunities for active transportation projects.

Orange County Council of Governments (OCCOG)

The Orange County Council of Governments (OCCOG) is a voluntary joint-powers agency that is Orange County's sub-regional planning organization and serves as a channel for local jurisdictions to engage cooperatively on matters such as land use, energy, mobility, air quality, and water. OCCOG's first three-year Strategic Plan, published in May 2016, outlines goals for the organization through 2019 including county advocacy at the regional level. OCCOG also recently completed its Complete Streets Initiative Design Handbook and Funding Toolkit, which aims to help local jurisdictions comply with state Complete Streets legislation, helps guide policy development, and provides design guidance for implementing Complete Streets principles in communities.

Foothill Circulation Phasing Plan (FCPP)

Adopted in September 1987, the Foothill Circulation Phasing Plan (FCPP) provides for roadway construction and improvements in the Foothill area to accommodate new development. Cities in the Foothill area that are subject to the FCPP, including Lake Forest, collect FCPP fees at the time building permits are issued. Roadway construction and improvements are financed and constructed to correspond with development in the Foothill area.

Foothill and Eastern Transportation Corridor Fee Program

The Transportation Corridor Agencies (TCA) operate the publicly-owned toll facilities in Orange County: State Route (SR) 73 (SR-73), State Route 133 (SR-133), State Route 241 (SR-241), and State Route 261 (SR-261). These roads were financed with bonds which are backed by toll revenues and development impact fees. Development impact fees are assessed on new construction in areas that benefit from these four toll facilities. Lake Forest falls within two fee zones: Foothill/Eastern (F/E) Zone A (north of Trabuco Road) and F/E Zone B (south of Trabuco Road), which run parallel to SR-241 and I-5, respectively. Fees are assessed on a per-unit basis for residential development and on a per square footage basis for non-residential square footage and are collected when a building permit is issued.

Metrolink

Metrolink is a regional transportation agency providing passenger rail service to Los Angeles, Ventura, Riverside, San Bernardino, Orange, and San Diego[11] Counties. Metrolink's 10-year Strategic Plan and 5-Year Short Range Transit Plan were approved by the Metrolink Board of Directors in March 2016. These plans are policy documents that guide transportation funding decisions and establishes goals for the agency in the upcoming years. Metrolink does not provide a station in the City of Lake Forest, but Lake Forest residents can access Metrolink trains at the Irvine and Laguna Niguel/Mission Viejo stations. These stations provide directions to downtown Los Angeles, San Bernardino, and Oceanside.

[11] Metrolink Inland Empire-Orange County Line and Orange County Line service extend to one station in San Diego County (Oceanside).

LOCAL

Lake Forest General Plan Update

As part of the Lake Forest General Plan Update, the Mobility Element provides the framework for decisions concerning the city's multimodal transportation system, which includes roadway, transit, bicycle, pedestrian, and rail modes of travel. The Mobility Element provides for coordination with the Orange County Transportation Authority (OCTA), which serves as the coordinating agency for transportation funding for Orange County. The goals detailed in the updated Mobility Element are noted below.

- **Goal M-1: Regional and Local Roads** – A transportation system that meets and balances local and regional mobility needs.
- **Goal M-2: Traffic Flow/System Efficiency** – Provide a vehicular transportation system with adequate levels of traffic flow and operations while maximizing efficiency.
- **Goal M-3: Complete Streets** – Provide a citywide a transportation network that is safe and accessible for all transportation modes and users.
- **Goal M-4: Public Transit** – Support increased public transportation use in the City.
- **Goal M-5: Bicycle, Pedestrian, and Equestrian Use** – Support and promote the use of pedestrian, bicycle, and equestrian facilities.
- **Goal M-6: Safety** – Provide a safe transportation system for all users.
- **Goal M-7: Parking** – Ensure an adequate and convenient parking supply in the City.
- **Goal M-8: Vehicle Miles Traveled** – Reduce citywide vehicle miles traveled per capita and contribute to regional and statewide greenhouse gas emission targets.
- **Goal M-9: Goods Movement** – Accommodate safe goods movement through the City's transportation network.
- **Goal M-10: Funding** – Ensure the utilization of various financing methods to improve and provide a fiscally sound transportation system.

Lake Forest Transportation Mitigation Program (LFTM)

The Lake Forest Transportation Mitigation Program (LFTM) was established to provide funding for the coordination and phased installation of transportation improvements in the city to mitigate the impacts of specific projects within the city. Fees are based on typical trip lengths and average daily trips for each type of land use. The City conducts a review of LFTM every five years. These updates assess whether any LFTM improvements should be reduced or eliminated and whether improvement costs should be updated or reallocated between projects; no new improvements are added to LFTM during these reviews. The City assesses mitigation needs and allocates fees using the Lake Forest Traffic Analysis Model (LFTAM), which was developed based on the Orange County Transportation Analysis Model (OCTAM), the subregional model developed by OCTA and based on the SCAG regional travel demand model.

Lake Forest Capital Improvement Plan

The City of Lake Forest Capital Improvement Plan (CIP) is a list of projects programmed for funding from identified funding sources for a three-year period. The most recent (2019-2021) CIP includes projects designed to improve safety, traffic flow, median and parkway landscaping, and maintain the roadway network. Transportation-related improvements in the current CIP include:

- Sidewalk repairs
- ADA ramps
- Roadway widening and turn lanes at intersections
- Traffic signal improvements
- Pavement resurfacing

Section 5
Level of Service Analysis

LEVEL OF SERVICE ANALYSIS

This chapter provides an assessment of roadway operations for the long-term buildout Cumulative (2040) Plus Plan Conditions. Under the requirements of SB 743, metrics such as LOS can no longer be used to assess transportation-related CEQA impacts. Therefore, this chapter provides roadway segment and intersection level of service for informational purposes. LOS for these facilities is compared to existing conditions; where needed, recommended improvements are provided to bring operations to acceptable levels and attain the City's goals for traffic flow and system efficiency.

TRAFFIC VOLUME FORECASTING

Daily roadway segment and AM and PM peak hours intersection traffic volume forecasts under Cumulative (2040) Plus Plan Conditions were developed utilizing the Orange County Transportation Analysis Model (OCTAM) and the Lake Forest Traffic Analysis Model (LFTAM) as follows.

Long-Range (2040) ADT roadway volumes for a scenario reflecting the current General Plan land uses and buildout of the Lake Forest and countywide roadway circulation system were developed using OCTAM Version 4 (OCTAM 4). Traffic growth factors were derived for each roadway segment by comparing existing daily volumes to the baseline Long-Range (2040) ADT forecasts. Baseline Long-Range (2040) peak hour intersection volumes were developed by applying the traffic growth factors for each individual roadway to the existing peak hour intersection counts. The Lake Forest Traffic Analysis Model (LFTAM) was then used to determine the incremental traffic volume differences between the current general plan and the General Plan Update under 2040 conditions for daily segment volumes as well as peak hour intersection turning movements. The resulting LFTAM-based incremental volume differences were applied to the 2040 baseline (current General Plan land use) OCTAM Version 4 volumes to develop the 2040 daily roadway and peak hour intersection forecasts for the General Plan Update scenario.

ASSUMED FUTURE ROADWAY IMPROVEMENTS

As part of both the travel demand modeling and the roadway segment and intersection operational analyses, roadway improvements were included as part of the 2040 assumptions. Improvements were included from the following sources, which are included in Appendix 3:

- Roadway widenings and lane additions that are assumed to be in place by 2040 (e.g. committed funding).
- Intersection improvements proposed as part of the 2019-2021 CIP.
- Intersection improvements included as part of LFTM.

ROADWAY SEGMENT ANALYSIS

The daily roadway segment volumes and operations under the Cumulative (2040) Plus Plan scenario are shown in Table 11. The daily roadway segment LOS was used to develop recommended roadway segment improvements for segments that either:

- Degraded from acceptable LOS (A/B/C/D) under Existing conditions to unacceptable LOS (E/F) under Cumulative (2040) Plus Plan conditions, or
- Operate at unacceptable LOS (E/F) under Existing Conditions and V/C increased by greater than 0.01 under Cumulative (2040) Plus Plan conditions

Under Cumulative (2040) Plus Plan conditions, the following roadway segments are projected to operate beyond the standard LOS D at the daily level:

- Portola Parkway, North of El Toro Road (LOS E)
- Bake Parkway, East of Commercentre Drive (LOS F)
- Bake Parkway, West of Commercentre Drive (LOS F)
- Bake Parkway, West of Trabuco Road (LOS F)
- Bake Parkway, West of Toledo Way (LOS F)
- Lake Forest Drive, East of Trabuco Road (LOS F)
- Lake Forest Drive, West of Rockfield Boulevard (LOS F)

With the addition of cumulative and Plan traffic, recommended roadway segment improvements are provided later in this chapter for the following facilities:

- Portola Parkway, North of El Toro Road: Degrades from acceptable LOS B to unacceptable LOS E.
- Bake Parkway, East of Commercentre Drive: Degrades from acceptable LOS C to unacceptable LOS F.
- Bake Parkway, West of Commercentre Drive: Degrades from acceptable LOS D to unacceptable LOS F.
- Bake Parkway, West of Trabuco Road: Degrades from acceptable LOS D to unacceptable LOS F.
- Bake Parkway, West of Toledo Way: Degrades from acceptable LOS D to unacceptable LOS F.
- Lake Forest Drive, East of Trabuco Road: Degrades from acceptable LOS D to unacceptable LOS F.
- Lake Forest Drive, West of Rockfield Boulevard: Operates at unacceptable LOS F under Existing conditions and V/C increases by greater than 0.01.

Table 11: Cumulative (2040) Plus Plan Roadway Segment Level of Service

Roadway	Segment	Existing			2040 Plus Plan			V/C Change
		Road way Type[1]	ADT[2]	LOS	Road way Type[1]	ADT[2]	LOS	
Trabuco Road	North of Lake Forest Drive	6D	21,535	A	6D	26,300	A	0.09

Roadway	Segment	Existing			2040 Plus Plan			V/C Change
		Road way Type[1]	ADT[2]	LOS	Road way Type[1]	ADT[2]	LOS	
	North of Ridge Route Drive	6D	22,336	A	6D	28,100	A	0.10
	North of El Toro Road	6D	25,107	A	6D	31,100	A	0.10
	South of El Toro Road	4D	21,730	A	4D	24,500	B	0.07
Toledo Way	North of Lake Forest Drive	4D	6,063	A	4D	9,700	A	0.10
	South of Lake Forest Drive	4U	5,812	A	4U	8,500	A	0.11
	South of Ridge Route Drive	4D	5,985	A	4D	8,500	A	0.07
Jeronimo Road	North of Lake Forest Drive	4D	13,482	A	4D	15,700	A	0.06
	North of Ridge Route Drive	4U	13,349	A	4U	16,200	B	0.12
	North of El Toro Road	4D	14,359	A	4D	16,300	A	0.05
	South of El Toro Road	4D	21,648	A	4D	24,300	B	0.07
Muirlands Boulevard	North of Lake Forest Drive	4D	13,936	A	4D	15,200	A	0.04
	North of Ridge Route Drive	4D	17,180	A	4D	22,000	A	0.13
	South of Ridge Route Drive	4D	19,578	A	4D	23,600	B	0.11
	South of El Toro Road	4D	20,709	A	4D	24,200	B	0.10
Rockfield Boulevard	North of Lake Forest Drive	4D	21,911	A	4D	30,000	C	0.22
	North of Ridge Route Drive	4D	17,549	A	4D	31,600	D	0.37
	North of El Toro Road	4D	18,642	A	4D	25,700	B	0.19
	North of Los Alisos Boulevard	4D	13,707	A	4D	20,700	A	0.18
Portola Parkway	North of Alton Parkway	4D	5,976	A	4D	14,700	A	0.23
	North of Bake Parkway	5D	17,526	A	6D	22,900	A	0.04

Roadway	Segment	Existing			2040 Plus Plan			V/C Change
		Road way Type[1]	ADT[2]	LOS	Road way Type[1]	ADT[2]	LOS	
	North of Lake Forest Drive	5D	23,677	A	6D	33,700	A	0.09
	North of Glenn Ranch Road	6D	32,283	A	6D	41,900	C	0.17
	North of SR-241	6D	25,325	A	6D	43,200	C	0.32
	South of SR-241	6D	27,477	A	6D	37,900	B	0.18
	North of El Toro Road	6D	35,739	B	6D	**51,100**	**E**	0.27
	South of El Toro Road	7D	37,996	A	6D	46,100	D	0.24
Rancho Parkway South	North of Bake Parkway	4D	7,400	A	4D	13,100	A	0.15
Rancho Parkway	South of Bake Parkway	4D	13,914	A	4D	22,900	B	0.24
	South of Lake Forest Drive	4D	19,440	A	4D	29,800	C	0.27
Glenn Ranch Road	Portola Parkway to Saddleback Ranch Road	4D	16,076	A	4D	27,200	C	0.30
	Saddleback Ranch Road to El Toro Road	4D	6,849	A	4D	7,400	A	0.02
Alton Parkway	West of Portola Parkway	6D	13,231	A	6D	30,500	A	0.30
	West of SR-241	6D	19,122	A	6D	31,600	A	0.22
	West of Rancho Parkway South	6D	23,261	A	6D	35,400	B	0.22
	East of Trabuco Road	6D	24,382	A	6D	39,300	B	0.27
Bake Parkway	West of Towne Center Drive	4D	26,318	B	4D	33,400	D	0.19
	East of Commercentre Drive	4D	29,630	C	4D	**43,300**	**F**	0.36

Roadway	Segment	Existing			2040 Plus Plan			V/C Change
		Road way Type[1]	ADT[2]	LOS	Road way Type[1]	ADT[2]	LOS	
	West of Commercentre Drive	4D	32,335	D	4D	**54,100**	**F**	0.58
	West of Trabuco Road	6D	46,162	D	6D	**62,400**	**F**	0.29
	West of Toledo Way	6D	49,268	D	6D	**66,300**	**F**	0.30
Lake Forest Drive	West of Portola Parkway	4D	9,502	A	4D	21,400	A	0.32
	East of Rancho Parkway	4D	18,493	A	4D	29,400	C	0.29
	West of Rancho Parkway	4D	20,894	A	4D	27,200	C	0.17
	East of Trabuco Road	4D	31,667	D	4D	**39,400**	**F**	0.21
	West of Trabuco Road	6D	31,178	A	6D	37,500	B	0.12
	East of Jeronimo Road	6D	33,027	A	6D	41,300	C	0.14
	East of Muirlands Boulevard	6D	32,627	A	6D	40,200	C	0.13
	West of Muirlands Boulevard	6D	36,011	B	6D	45,700	D	0.17
	West of Rockfield Boulevard	6D	**59,276**	**F**	6D	**74,300**	**F**	0.27
Ridge Route Drive	East of Toledo Way	4D	6,666	A	4D	11,200	A	0.12
	East of Jeronimo Road	4U	7,428	A	4U	11,500	A	0.16
	West of Jeronimo Road	2D	7,689	A	2D	12,500	B	0.26
	East of Muirlands Boulevard	4D	6,886	A	4D	12,400	A	0.15
	East of Rockfield Boulevard	4D	6,811	A	4D	9,600	A	0.08

Roadway	Segment	Existing			2040 Plus Plan			V/C Change
		Road way Type[1]	ADT[2]	LOS	Road way Type[1]	ADT[2]	LOS	
	West of Rockfield Boulevard	4D	2,524	A	4D	4,700	A	0.06
El Toro Road	East of Glenn Ranch Road	3D	13,969	A	6D	19,400	A	-0.16
	West of Glenn Ranch Road	3D	14,800	A	6D	19,700	A	-0.18
	East of Santa Margarita Parkway	5D	13,832	A	6D	17,400	A	0.01
	West of Santa Margarita Parkway	6D	25,322	A	6D	28,400	A	0.05
	East of Trabuco Road	5D	31,358	B	6D	39,200	B	0.03
	West of Trabuco Road	6D	35,784	B	6D	38,300	B	0.04
	East of Jeronimo Road	6D	38,539	B	6D	42,200	C	0.06
	East of Muirlands Boulevard	6D	40,733	C	6D	46,800	D	0.11
	West of Muirlands Boulevard	8D	44,716	A	8D	52,900	C	0.11
	West of Rockfield Boulevard	9D	54,028	B	9D	76,000	D	0.26
Los Alisos Boulevard	East of Jeronimo Road	6D	28,974	A	6D	33,000	A	0.07
	East of Muirlands Boulevard	6D	30,001	A	6D	36,500	B	0.12
	West of Muirlands Boulevard	6D	27,284	A	6D	30,100	A	0.05
	West of Rockfield Boulevard	4D	25,047	B	4D	27,500	C	0.06
Commercentre Drive	South of Alton Parkway	4D	7,546	A	4D	19,300	A	0.31
	South of Bake Parkway	4D	11,085	A	4D	19,100	A	0.21

Roadway	Segment	Existing			2040 Plus Plan			V/C Change
		Road way Type[1]	ADT[2]	LOS	Road way Type[1]	ADT[2]	LOS	
	North of Dimension Drive	4D	7,896	A	4D	14,500	A	0.18
Dimension Drive	North of Commercentre Drive	4D	5,963	A	4D	13,900	A	0.21
	South of Commercentre Drive	4D	12,021	A	4D	24,500	B	0.33

Note: **Bold** signifies unacceptable level of service.
Shading signifies improvements recommended.
1. Roadway type refers to number of lanes and divided (D) or undivided (U)
2. ADT denotes Average Daily Traffic
Source: Kittelson & Associates, Inc., 2019

INTERSECTION ANALYSIS

The weekday AM and PM peak hour intersection turning movement volumes and lane configurations for Cumulative (2040) Plus Plan conditions are provided in Figure 9. The AM and PM operations under the Cumulative (2040) Plus Plan scenario (under the ICU analysis methodology) are shown in Table 12. The intersection operations under the ICU methodology were used to develop recommended intersection improvements for area-wide intersections that either:

- Degraded from acceptable LOS (A/B/C/D) under Existing conditions to unacceptable LOS (E/F) under Cumulative (2040) Plus Plan conditions, or
- Operate at unacceptable LOS (E/F) under Existing Conditions and V/C increased by greater than 0.01 under Cumulative (2040) Plus Plan conditions

Additionally, the AM and PM operations of freeway/highway ramp intersections under the Cumulative (2040) Plus Plan scenario (using the HCM analysis methodology) are shown in Table 13. The ramp intersection operations under the HCM methodology were used to develop recommended intersection improvements for ramp intersections that either:

- Degraded from acceptable LOS (A/B/C) under Existing conditions to unacceptable LOS (D/E/F) under Cumulative (2040) Plus Plan conditions, or
- Operate at unacceptable LOS (D/E/F) under Existing Conditions and delay increased by 2.0 seconds or greater under Cumulative (2040) Plus Plan conditions

Table 12: Cumulative (2040) Plus Plan Intersection Level of Service (ICU Methodology)

Intersection		Peak Hour	Existing		2040 Plus Plan		Change
			V/C	LOS	V/C	LOS	
1	Alton Parkway & Portola Parkway	AM	0.41	A	0.48	A	0.07
		PM	0.30	A	0.43	A	0.13
2	Bake Parkway & Portola Parkway	AM	0.45	A	0.48	A	0.03
		PM	0.51	A	0.62	B	0.11
3	Lake Forest Drive & Portola Parkway	AM	0.44	A	0.56	A	0.12
		PM	0.43	A	0.61	B	0.18
4	Glenn Ranch Road & Portola Parkway	AM	0.36	A	0.55	A	0.19
		PM	0.47	A	0.62	B	0.15
5	Portola Parkway & SR-241 Ramps	AM	0.38	A	0.66	B	0.28
		PM	0.39	A	0.77	C	0.38
6	Alton Parkway & SR-241 Ramps	AM	0.41	A	0.67	B	0.26
		PM	0.37	A	0.69	B	0.32
7	Lake Forest Drive & SR-241 NB On-Ramp	AM	0.23	A	0.39	A	0.16
		PM	0.26	A	0.46	A	0.20
8	Lake Forest Drive & SR-241 SB Off-Ramp	AM	0.28	A	0.47	A	0.19
		PM	0.30	A	0.57	A	0.27
9	Bake Parkway & Rancho Parkway	AM	0.47	A	0.63	B	0.16
		PM	0.59	A	0.76	C	0.17
10	Lake Forest Drive & Rancho Parkway	AM	0.45	A	0.73	C	0.28
		PM	0.59	A	0.89	D	0.30
11	Bake Parkway & Rancho Parkway South	AM	0.55	A	**0.96**	**E**	0.42
		PM	0.53	A	0.85	D	0.36
12	El Toro Road & Portola Parkway/Santa Margarita Parkway	AM	0.61	B	0.64	B	0.03
		PM	0.68	B	0.76	C	0.08
13	Bake Parkway & Commercentre Drive	AM	0.47	A	0.78	C	0.31
		PM	0.47	A	0.68	B	0.21
14	Bake Parkway & Irvine Boulevard/Trabuco Road	AM	0.65	B	0.74	C	0.09
		PM	0.68	B	0.78	C	0.10
15	Lake Forest Drive & Trabuco Road	AM	0.58	A	0.71	C	0.13
		PM	0.58	A	0.71	C	0.13
16	Ridge Route Drive & Trabuco Road	AM	0.43	A	0.60	A	0.17
		PM	0.50	A	0.61	B	0.11
17	El Toro Road & Trabuco Road	AM	0.62	B	0.68	B	0.06
		PM	0.60	A	0.69	B	0.09
18	Bake Parkway & Toledo Way	AM	0.73	C	0.87	D	0.14
		PM	0.57	A	0.82	D	0.25
19	Lake Forest Drive & Toledo Way	AM	0.53	A	0.66	B	0.13
		PM	0.53	A	0.69	B	0.16

Intersection		Peak Hour	Existing		2040 Plus Plan		Change
			V/C	LOS	V/C	LOS	
20	Ridge Route Drive & Toledo Way	AM	0.33	A	0.60	A	0.27
		PM	0.27	A	0.40	A	0.13
21	El Toro Road & Toledo Way	AM	0.53	A	0.58	A	0.05
		PM	0.44	A	0.53	A	0.09
22	Bake Parkway & Jeronimo Road	AM	**0.92**	**E**	**0.93**	**E**	0.01
		PM	0.74	C	**0.95**	**E**	0.21
23	Lake Forest Drive & Jeronimo Road	AM	0.64	B	0.69	B	0.05
		PM	0.72	C	0.86	D	0.14
24	Ridge Route Drive & Jeronimo Road	AM	0.47	A	0.56	A	0.09
		PM	0.46	A	0.59	A	0.13
25	El Toro Road & Jeronimo Road	AM	0.66	B	0.69	B	0.03
		PM	0.81	D	0.85	D	0.04
26	Los Alisos Boulevard & Jeronimo Road	AM	0.65	B	0.78	C	0.13
		PM	0.66	B	0.74	C	0.08
27	Lake Forest Drive & Muirlands Boulevard	AM	0.49	A	0.59	A	0.10
		PM	0.70	B	0.79	C	0.09
28	Ridge Route Drive & Muirlands Boulevard	AM	0.42	A	0.49	A	0.07
		PM	0.54	A	0.59	A	0.05
29	El Toro Road & Muirlands Boulevard	AM	0.61	B	0.74	C	0.13
		PM	0.70	B	0.81	D	0.11
30	Los Alisos Boulevard & Muirlands Boulevard	AM	0.68	B	0.66	B	-0.02
		PM	0.70	B	0.66	B	-0.04
31	Lake Forest Drive & Rockfield Boulevard	AM	0.55	A	0.69	B	0.14
		PM	0.66	B	**0.95**	**E**	0.29
32	Ridge Route Drive & Rockfield Boulevard	AM	0.35	A	0.45	A	0.10
		PM	0.45	A	0.73	C	0.28
33	El Toro Road & Rockfield Boulevard	AM	0.56	A	0.82	D	0.26
		PM	0.61	B	0.73	C	0.12
34	Los Alisos Boulevard & Rockfield Boulevard	AM	0.69	B	0.66	B	-0.03
		PM	0.54	A	0.59	A	0.05
35	Lake Forest Drive & I-5 NB Ramps	AM	0.42	A	0.52	A	0.10
		PM	0.47	A	0.62	B	0.15
36	Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota	AM	0.46	A	0.65	B	0.19
		PM	0.78	C	**1.07**	**F**	0.29
37	Paseo De Valencia & Avenida De La Carlota	AM	0.48	A	0.61	B	0.13
		PM	0.51	A	0.62	B	0.11
38	El Toro Road & Bridger Road/I-5 NB Ramps	AM	0.63	B	0.78	C	0.15
		PM	0.66	B	**0.96**	**E**	0.30

Intersection		Peak Hour	Existing		2040 Plus Plan		Change
			V/C	LOS	V/C	LOS	
39	El Toro Road & Avenida De La Carlota	AM	0.37	A	0.47	A	0.10
		PM	0.56	A	0.78	C	0.22
40	Portola Parkway & Rancho Parkway	AM	0.46	A	0.61	B	0.19
		PM	0.58	A	0.54	A	0.23
41	Alton Parkway & Rancho Parkway South	AM	0.46	A	0.67	B	0.15
		PM	0.40	A	0.82	D	0.14
42	Alton Parkway & Commercentre	AM	0.42	A	0.44	A	0.25
		PM	0.52	A	0.46	A	0.30
51	El Toro Road & Glenn Ranch Road	AM	0.47	A	0.81	D	-0.03
		PM	0.58	A	0.88	D	-0.12
56	Bake Parkway & Dimension Drive	AM	0.44	A	0.58	A	0.37
		PM	0.59	A	0.70	B	0.29
57	Lake Forest Drive & Dimension Drive	AM	0.34	A	0.59	A	0.24
		PM	0.48	A	0.89	D	0.22
60	Dimension Drive & Commercentre Drive	AM	0.39	A	0.65	B	0.20
		PM	0.53	A	0.51	A	0.36
101	Lake Forest Drive & Pittsford Drive	AM	0.59	A	0.49	A	0.06
		PM	0.42	A	0.39	A	0.09
102	El Toro Road & Northcrest Drive	AM	0.42	A	0.61	B	0.07
		PM	0.45	A	0.54	A	-0.06

Note: **Bold** signifies unacceptable level of service.
Shading signifies improvements recommended.
Source: Kittelson & Associates, Inc., 2019

Table 13: Cumulative (2040) Plus Plan Intersection Level of Service (HCM Methodology)

Intersection		Peak Hour	Existing		2040 Plus Plan		Change
			Delay	LOS	Delay	LOS	
5	Portola Parkway & SR-241 Ramps	AM	23.8	C	**43.1**	**D**	19.3
		PM	21.5	C	**49.5**	**D**	28.0
6	Alton Parkway & SR-241 Ramps	AM	24.6	C	**36.7**	**D**	12.1
		PM	21.6	C	34.0	C	12.4
7	Lake Forest Drive & SR-241 NB On-Ramp	AM	4.0	A	3.5	A	-0.5
		PM	3.7	A	3.8	A	0.1
8	Lake Forest Drive & SR-241 SB Off-Ramp	AM	7.9	A	8.2	A	0.3
		PM	6.0	A	7.8	A	1.8
35	Lake Forest Drive & I-5 NB Ramps	AM	11.4	B	16.5	B	5.1
		PM	31.0	C	27.4	C	-3.6
36	Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota	AM	25.2	C	29.8	C	4.6
		PM	28.0	C	**80.1**	**F**	52.1
37	Paseo De Valencia & Avenida De La Carlota	AM	**43.1**	**D**	**42.7**	**D**	-0.4
		PM	**41.3**	**D**	**52.1**	**D**	10.8
38	El Toro Road & Bridger Road/I-5 NB Ramps	AM	21.4	C	31.1	C	9.7
		PM	**41.4**	**D**	**61.9**	**E**	20.5

Note: **Bold** signifies unacceptable level of service.
Shading signifies improvements recommended.
Source: Kittelson & Associates, Inc., 2019

Under Cumulative (2040) Plus Plan conditions, the following intersections are projected to operate beyond the standard LOS D under the ICU methodology:

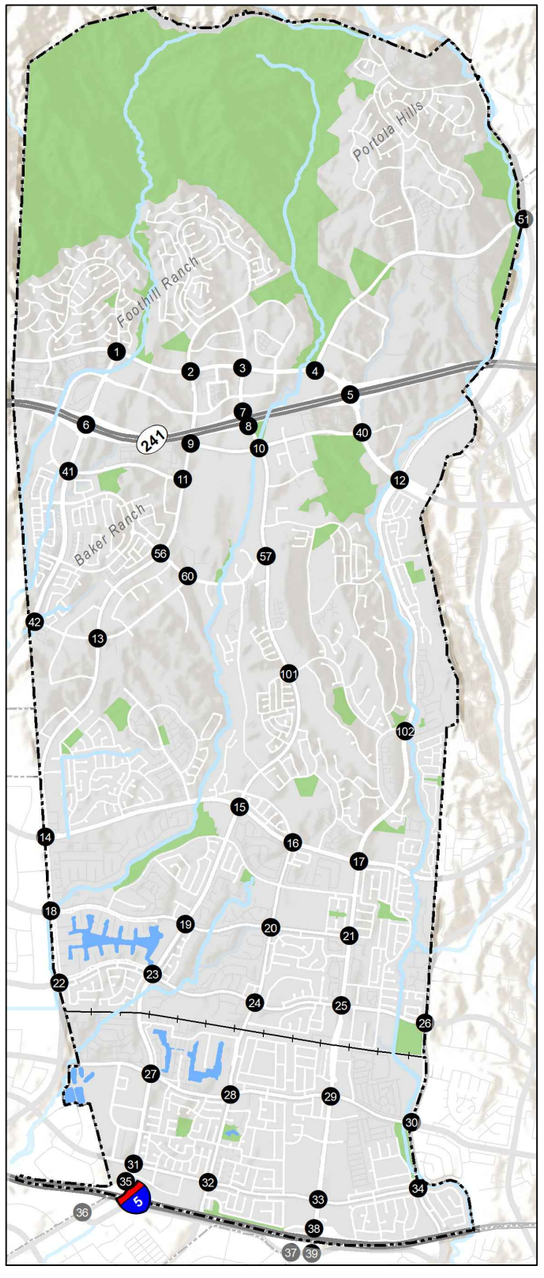
- #11 Bake Parkway & Rancho Parkway South (LOS E during the AM peak hour)
- #22 Bake Parkway & Jeronimo Road (LOS E during the AM and PM peak hours)
- #31 Lake Forest Drive & Rockfield Boulevard (LOS E during the PM peak hour)
- #36 Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota (LOS F during the PM peak hour)
- #38 El Toro Road & Bridger Road/I-5 NB Ramps (LOS E during the PM peak hour)

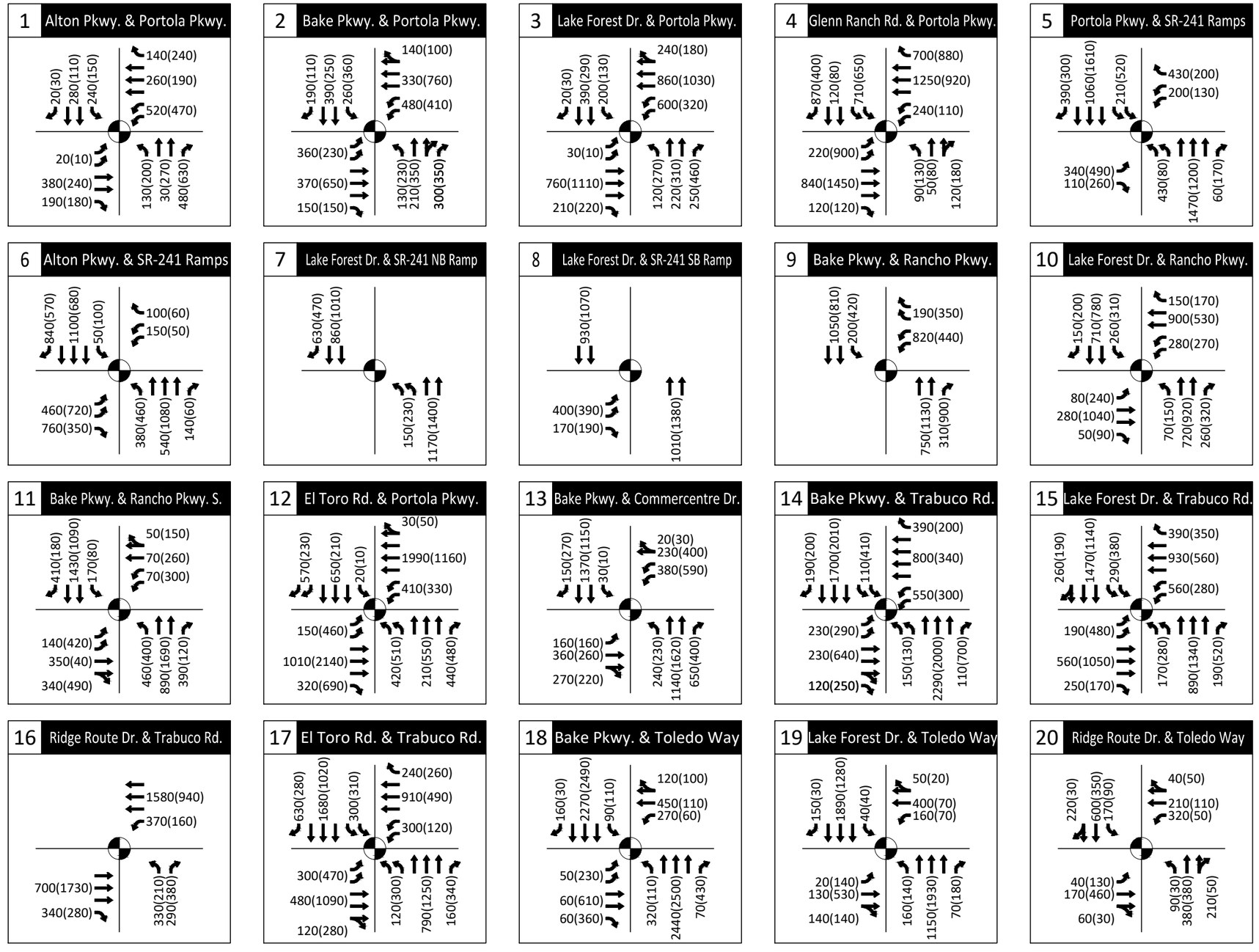
In addition, under Cumulative (2040) Plus Plan conditions, the following ramp intersections are projected to operate beyond the standard LOS C under the HCM methodology:

- #5 Portola Parkway & SR-241 Ramps (LOS D during the AM and PM peak hours)
- #6 Alton Parkway & SR-241 Ramps (LOS D during the AM peak hour)
- #36 Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota (LOS F during the PM peak hour)
- #37 Paseo De Valencia & Avenida De La Carlota (LOS D during the AM and PM peak hours)
- #38 El Toro Road & Bridger Road/I-5 NB Ramps (LOS E during the PM peak hour)

With the addition of cumulative and Plan traffic, recommended intersection improvements are provided later in this chapter for the following facilities:

- #5 Portola Parkway & SR-241 Ramps:
  - Degrades from acceptable LOS C to unacceptable LOS D during the AM and PM peak hours (under the HCM methodology).
- #6 Alton Parkway & SR-241 Ramps:
  - Degrades from acceptable LOS C to unacceptable LOS D during the AM peak hour (under the HCM methodology).
- #11 Bake Parkway & Rancho Parkway South:
  - Degrades from acceptable LOS A to unacceptable LOS E during the AM peak hour (under the ICU methodology).
- #22 Bake Parkway & Jeronimo Road:
  - Degrades from acceptable LOS C to unacceptable LOS E during the PM peak hour (under the ICU methodology).
- #31 Lake Forest Drive & Rockfield Boulevard:
  - Degrades from acceptable LOS B to unacceptable LOS E during the AM peak hour (under the ICU methodology).
- #36 Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota:
  - Degrades from acceptable LOS C to unacceptable LOS E during the PM peak hour (under the ICU methodology).
  - Degrades from acceptable LOS C to unacceptable LOS F during the PM peak hour (under the HCM methodology).
- #37 Paseo De Valencia & Avenida De La Carlota:
  - Operates at unacceptable LOS D during the PM peak hour under Existing conditions and delay increases by 2.0 or more seconds (under the HCM methodology).
- #38. El Toro Road & Bridger Road/I-5 NB Ramps:
  - Degrades from acceptable LOS B to unacceptable LOS E during the PM peak hour (under the ICU methodology).
  - Operates at unacceptable LOS D during the PM peak hour under Existing conditions and delay increases by 2.0 or more seconds and degrades to LOS E (under the HCM methodology).





AM(PM) - Traffic Volume

- Traffic Signal

Cumulative (2040) Plus Plan AM & PM Peak Hour Traffic Volumes and Lane Geometries
Lake Forest, CA

Figure
9

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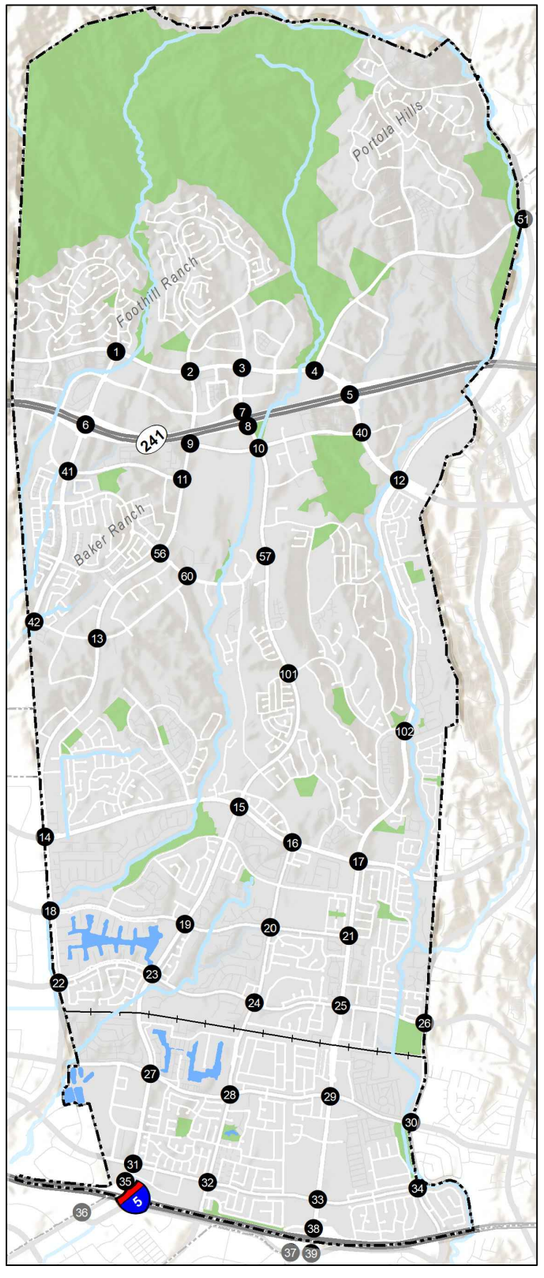

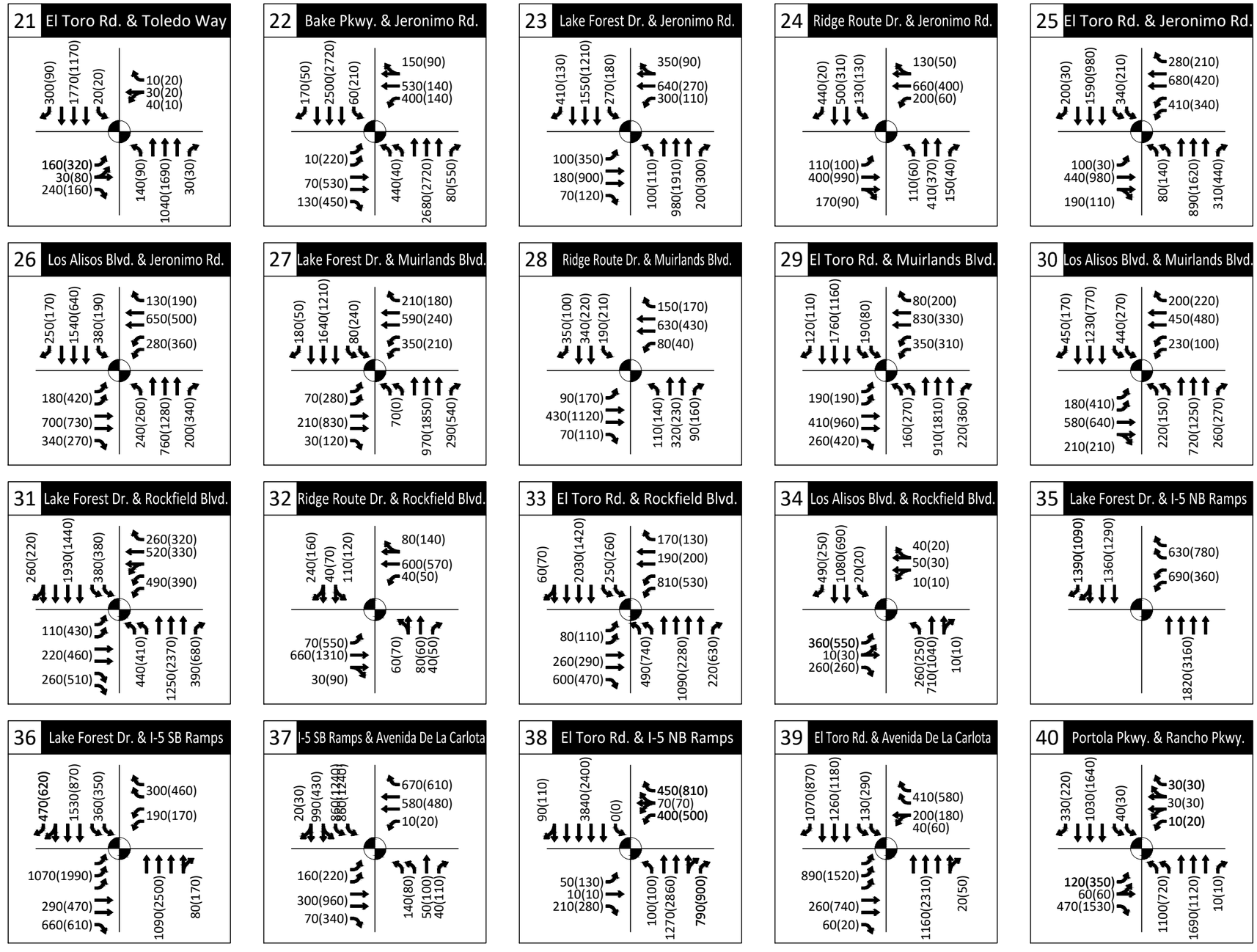

AM(PM) - Traffic Volume

- Traffic Signal

Cumulative (2040) Plus Plan AM & PM Peak Hour Traffic Volumes and Lane Geometries
Lake Forest, CA

Figure
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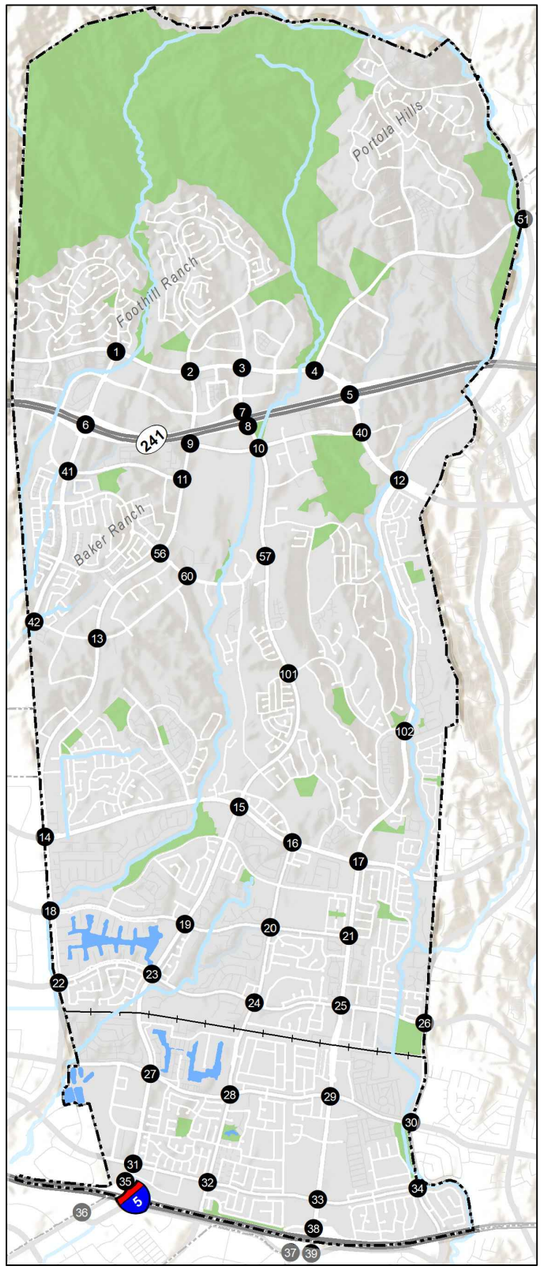

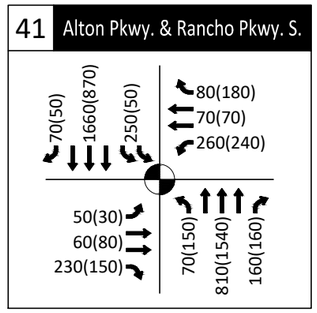

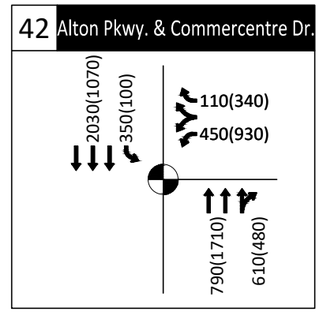

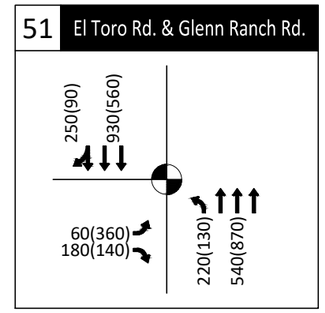

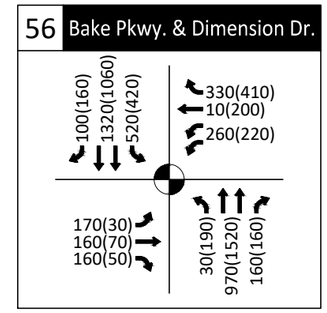

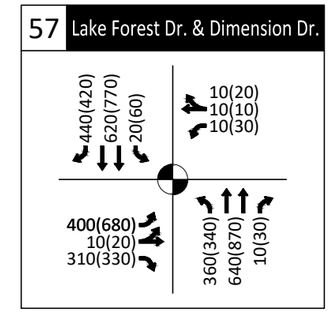

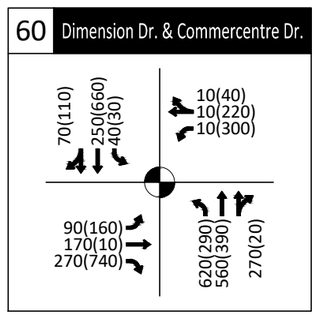

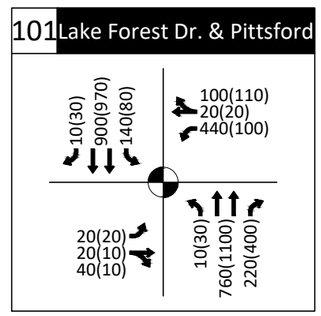

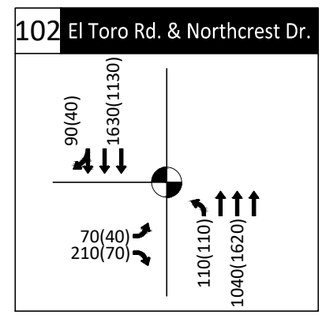

AM(PM) - Traffic Volume

- Traffic Signal

Cumulative (2040) Plus Plan AM & PM Peak Hour Traffic Volumes and Lane Geometries
Lake Forest, CA

Figure
9

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RECOMMENDED IMPROVEMENTS

Based on the LOS analysis results and the operational standards outlined earlier in this chapter, recommended roadway segment and intersection improvements were developed to accommodate Cumulative (2040) Plus Plan traffic levels at acceptable levels, and to attain the City's goals for traffic flow and system efficiency.

Recommended Roadway Segment Improvements

Roadway segment improvements are recommended to accommodate daily traffic levels under the Cumulative (2040) Plus Plan scenario. These improvements consist of installing one or more through lanes on each segment. As land use projects throughout the City are approved and developed, the City should continue to monitor conditions along these segments to determine the appropriate timing and/or level of improvement along these facilities, and implement improvements as appropriate.

Portola Parkway, North of El Toro Road: Under Cumulative (2040) Plus Plan conditions, this segment degrades from acceptable LOS B to unacceptable LOS E at the daily level. With the addition of one more lane (seven total), this segment would operate acceptably at LOS C.

Bake Parkway, East of Commercentre Drive: Under Cumulative (2040) Plus Plan conditions, this segment degrades from acceptable LOS C to unacceptable LOS F at the daily level. With the addition of two more lanes (six total), this segment would operate acceptably at LOS C.

Bake Parkway, West of Commercentre Drive: Under Cumulative (2040) Plus Plan conditions, this segment degrades from acceptable LOS D to unacceptable LOS F at the daily level. With the addition of three more lanes (seven total), this segment would operate acceptably at LOS D.

Bake Parkway, West of Trabuco Road: Under Cumulative (2040) Plus Plan conditions, this segment degrades from acceptable LOS D to unacceptable LOS F at the daily level. With the addition of two more lanes (eight total), this segment would operate acceptably at LOS D.

Bake Parkway, West of Toledo Way: Under Cumulative (2040) Plus Plan conditions, this segment degrades from acceptable LOS D to unacceptable LOS F at the daily level. With the addition of two more lanes (eight total), this segment would operate acceptably at LOS D.

Lake Forest Drive, East of Trabuco Road: Under Cumulative (2040) Plus Plan conditions, this segment degrades from acceptable LOS D to unacceptable LOS F at the daily level. With the addition of one more lane (five total), this segment would operate acceptably at LOS D.

Lake Forest Drive, West of Rockfield Boulevard: This segment operates at unacceptable LOS F at the daily level under Existing conditions and the V/C increases by greater than 0.01 under Cumulative (2040) Plus Plan conditions. With the addition of two more lanes (eight total), this segment would operate at better than pre-project conditions at LOS E.

Recommended Intersection Improvements

Intersection improvements are recommended to accommodate AM and PM peak hours traffic levels under the Cumulative (2040) Plus Plan scenario under both the ICU and HCM methodologies. These improvements consist of either intersection lane geometry and/or signal timing changes. Similar to the recommended roadway segment improvements, as land use projects throughout the City are approved and developed, the City should continue to monitor conditions at these intersections to determine the appropriate timing and/or level of improvement along these facilities.

The following intersection improvements could be implemented with either restriping or minimal right-of-way acquisition and curb modifications:

#11 Bake Parkway & Rancho Parkway South: Under Cumulative (2040) Plus Plan conditions, this intersection degrades from acceptable LOS A to unacceptable LOS E during the AM peak hour (under the ICU methodology). The intersection would operate acceptably at LOS D (V/C ratio of 0.90) with the conversion of the outer southbound left turn lane to an southbound through lane, which could be accommodated with restriping.

#22 Bake Parkway & Jeronimo Road: Under Cumulative (2040) Plus Plan conditions, this intersection degrades from acceptable LOS C to unacceptable LOS E during the PM peak hour (under the ICU methodology). The intersection would operate acceptably at LOS D (V/C ratio of 0.89) with the installation of an additional westbound left turn lane; this improvement may require minor widening of the intersection's east leg.

#31 Lake Forest Drive & Rockfield Boulevard: Under Cumulative (2040) Plus Plan conditions, this intersection degrades from acceptable LOS B to unacceptable LOS E during the AM peak hour (under the ICU methodology). This intersection would operate acceptably at LOS D (V/C ratio of 0.88) with the conversion of the northbound right-turn lane to a northbound shared through-right lane; this improvement could be accommodated with restriping, and a receiving lane is available on the intersection's north leg.

The following intersection improvements may not be feasible due to jurisdictional and/or right-of-way concerns. The City should monitor conditions at these intersections and determine the level of feasible improvements possible at these locations, coordinating with relevant jurisdictions or agencies as needed.

#5 Portola Parkway & SR-241 Ramps: Under Cumulative (2040) Plus Plan conditions, this intersection degrades from acceptable LOS C to unacceptable LOS D during the AM and PM peak hours (under the HCM methodology). This intersection could operate acceptably at LOS C during both peak hours (32.0 and 33.0 seconds of delay) with the installation of a second eastbound left turn lane. This improvement may be infeasible due to the need to restructure/widen the off-ramp and is also under Caltrans jurisdiction.

#6 Alton Parkway & SR-241 Ramps: Under Cumulative (2040) Plus Plan conditions, this intersection degrades from acceptable LOS C to unacceptable LOS D during the AM peak hour (under the HCM

methodology). This intersection could operate acceptably at LOS C (30.7 seconds of delay) with the installation of a second eastbound left turn lane. While the intersection could accommodate the additional turn lane, this improvement may be infeasible due to the need to restructure/widen the receiving on-ramp; in addition, the intersection and on-ramp are under Caltrans jurisdiction.

#36 Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota: Under Cumulative (2040) Plus Plan conditions, this intersection degrades from acceptable LOS C to unacceptable LOS E during the PM peak hour (under the ICU methodology); the intersection also degrades from acceptable LOS C to unacceptable LOS F during the PM peak hour (under the HCM methodology). This intersection could operate acceptably under both methodologies (LOS D with a V/C of 0.90; LOS C with a delay of 31.7 seconds) with the implementation of the following improvements: add an eastbound right turn lane; add a northbound right turn lane with turn pocket; convert the inner southbound through lane to a left turn lane; add a southbound right turn lane; add a third westbound left turn lane; optimize signal timing splits. This improvement may be infeasible due to right-of-way constraints on additional turn lanes at this location, including for receiving lanes on the intersection's east leg; in addition, this intersection is under Caltrans jurisdiction.

#37 Paseo De Valencia & Avenida De La Carlota: This intersection operates at unacceptable LOS D during the PM peak hour under Existing conditions and delay increases by 2.0 or more seconds under Cumulative (2040) Plus Plan conditions (under the HCM methodology). This intersection could operate at pre-project conditions at LOS D (41.3 seconds of delay) with the conversion of the westbound through-left turn lane to a left turn lane, and signal timing optimization. While this improvement could be implemented with restriping and signal timing adjustments, it may be infeasible since the intersection is under Caltrans jurisdiction. It should be noted that this location is under study for future improvements by Caltrans and OCTA as part of the I-5/El Toro Road Interchange Project.

#38. El Toro Road & Bridger Road/I-5 NB Ramps: Under Cumulative (2040) Plus Plan conditions, this intersection degrades from acceptable LOS B to unacceptable LOS E during the PM peak hour (under the ICU methodology); this intersection also operates at unacceptable LOS D during the PM peak hour under Existing conditions and delay increases by 2.0 or more seconds and degrades to LOS E under Cumulative (2040) Plus Plan conditions (under the HCM methodology). This intersection could operate acceptably under the ICU methodology (LOS D with a V/C of 0.82) and better than pre-project conditions under the HCM methodology (LOS D with 40.1 seconds of delay) with the implementation of the following improvements: add an additional eastbound through lane; add an additional northbound right turn lane. This improvement may be infeasible due to physical constraints at the I-5 overpass; in addition, this intersection is under Caltrans jurisdiction. It should be noted that this location is under study for future improvements by Caltrans and OCTA as part of the I-5/El Toro Road Interchange Project.

Section 6
Transportation Impact Analysis

TRANSPORTATION IMPACT ANALYSIS

This transportation impact analysis assesses how the study area's transportation system would operate with the implementation of the City of Lake Forest General Plan Update. The potential impacts were identified based on a set of significance criteria based on the California Environmental Quality Act (CEQA) guidelines. The significance criteria are presented below after a discussion on traffic generated by the Specific Plan.

GENERAL PLAN TRAFFIC

The Plan proposes significant infill development in the city with a mix of uses, as noted below. Please note, the proposed land uses represent the full citywide buildout and include existing development in the city.

- 29,167 single family residential units
- 22,167 multi-family residential units
- Approximately 5,567,524 square feet of office uses
- Approximately 9,733,234 square feet of retail uses
- Approximately 12,425,826 square feet of other non-residential uses

In total, the General Plan would result in a buildout of approximately 51,334 housing units, 152,462 residents, 27,726,585 non-residential square feet, and 52,241 employees within the City's boundaries.

As noted in Section 5, daily, AM peak hour, and PM peak hour volume forecasts for the General Plan were developed using the OCTAM and LFTAM travel demand models. Trip generation specific to the General Plan can be derived from LFTAM, which computes weekday daily, weekday AM and weekday PM peak hour trips. Under Cumulative Plus Plan conditions, the plan area would generate approximately 830,313 daily trips on a typical weekday.

STANDARDS OF SIGNIFICANCE

For the purposes of this transportation impact analysis, a significant transportation impact would occur if implementation of the Plan would:

1. Increase VMT per person above No Project conditions.
2. Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
3. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
4. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

5. Result in inadequate emergency access.
6. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

VMT Thresholds

As part of the new CEQA Guidelines updated for SB 743, the new criteria to replace LOS "shall promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." OPR released a final advisory in December 2018, which provided guidance for implementing VMT analysis as the most appropriate metric to evaluate a project's transportation impact. Therefore, this study assesses VMT (as opposed to LOS) to be consistent with requirements that will become mandatory on July 1, 2020.

The City of Lake Forest has not yet adopted guidelines on the appropriate metrics and thresholds of significance for SB 743-consistent VMT analysis. Therefore, this study assesses the changes in VMT per person between Cumulative (2040) No Project (Previous General Plan) and Cumulative (2040) Plus Plan (Proposed General Plan Update) to determine if the Plan would result in an increase in VMT per person in the city. Given that the Proposed General Plan Update consists of a land use and mobility plan with proposed changes at the citywide level, a threshold of no increase from the previous plan is appropriate to consider the effect of the plan on the environment. In particular, the Proposed General Plan update includes increases in residential, office, retail, and other land uses with in the city. A threshold of no increase in VMT per capita and VMT per employee from the Previous General Plan indicates that the Proposed General Plan would maintain travel characteristics within the city and not result in longer travel distances. Consistent with OPR guidance, LFTAM was utilized to estimate the following metrics for comparison purposes:

- Residential VMT per person (Home-based trip VMT per resident in the city)
- Commuter VMT per person (Work-based trip VMT per employee in the city)

Congestion Management Program (CMP) Operations Thresholds

Under Cumulative (2040) Plus Plan conditions, CMP intersections were analyzed. As documented in Section 2, CMP intersections are analyzed using the ICU methodology (Table 6). The following intersections are CMP-designated intersections according to the Orange County CMP and to be analyzed under CMP standards:

- #17 – El Toro Road & Trabuco Road
- #38 – El Toro Road & Bridger Road/I-5 NB Ramps
- #39 – El Toro Road & Avenida De La Carlota (in Laguna Hills)

The maximum acceptable level of service under this analysis is LOS E. For these intersections, the impact would be considered significant if:

- Plan traffic would cause the LOS at an intersection to degrade from LOS E or better to LOS F, or

- Project traffic would increase V/C by more than 0.10 at an intersection operating LOS F under no project conditions.

ITEM 1: VMT

The residential and commuter VMT under the previous General Plan and the proposed General Plan Update for the city of Lake Forest are shown in Table 14. As shown in the table, the General Plan Update is not expected to increase VMT per person above No Project/previous General Plan conditions. In fact, home-based VMT per resident is expected to decrease by 4% and work-based VMT per employee is expected to decrease by approximately 6% under the proposed General Plan Update. Part of this reduction could be attributed to the increasing amounts of residential and employment opportunities within the city with the Proposed General Plan Update. For example, the increase of office, retail, and other uses within the City would decrease the need for Lake Forest residents to travel long distances inside and outside the City for their employment or other needs, resulting in shorter vehicular travel distances per capita. In addition, the increased amount of residential uses within would help serve the current and future employment base and thus reduce the amount of inter-city commuting required.

Table 14: Cumulative (2040) VMT Comparison

Statistic	Previous General Plan	Proposed General Plan Update	Change in VMT per Resident/Employee
Home-Based VMT			
Home-Based Trip VMT	1,966,070	2,531,888	- 4.2%
Total Residents	102,567	137,776	
Home-Based VMT per Resident	19.2	18.4	
Work-Based VMT			
Work-Based Trip VMT	1,413,984	1,425,619	- 6.2%
Total Employees	62,193	66,775	
Work-Based VMT per Employee	22.7	21.3	

Source: Stantec, Inc., 2019

As shown in Table 14, the proposed General Plan update is not expected to increase VMT per person above No Project conditions. Therefore, the VMT-related impacts of the Plan would be considered **less than significant**.

ITEM 2: CONGESTION MANAGEMENT PROGRAM

Orange County Congestion Management Program (CMP) intersections were analyzed to identify potential impacts of the Plan on the CMP system. LOS under the ICU methodology for the three CMP intersections in the study area are shown in Table 15.

Table 15: Cumulative (2040) Plus Plan Intersection Level of Service (CMP Intersections)

Intersection		Peak Hour	Existing		2040 Plus Plan		Change
			V/C	LOS	V/C	LOS	
17	El Toro Road & Trabuco Road	AM	0.62	B	0.68	B	0.06
		PM	0.60	A	0.69	B	0.09
38	El Toro Road & Bridger Road/I-5 NB Ramps	AM	0.63	B	0.78	C	0.15
		PM	0.66	B	0.96	E	0.30
39	El Toro Road & Avenida De La Carlota	AM	0.37	A	0.47	A	0.10
		PM	0.56	A	0.78	C	0.22

Source: Kittelson & Associates, Inc., 2019

As shown in Table 15, the CMP intersections are expected to operate acceptably (LOS E or better) under Cumulative (2040) Plus Project conditions. Therefore, the impacts of the Plan to CMP facilities would be considered **less than significant**.

ITEM 3: INFLUENCE AIR TRAVEL PATTERNS

While Lake Forest is located approximately 10 miles southeast of John Wayne Airport, the nature of the Plan as a local plan for residential and commercial development (including mixed-used development) within the city of Lake Forest is such that it would not result in a change in air traffic patterns. Therefore, the impacts of the Plan to air travel patterns would be considered **less than significant**.

ITEM 4: DESIGN AND INCOMPATIBLE USE HAZARDS

The types of uses included within the city of Lake Forest as part of the Plan are generally similar to existing and surrounding uses and thereby are compatible with the existing uses in the Plan area and in the surrounding area.

In addition, the Mobility Element developed as part of the General Plan update contains policies in support of roadway network safety and reducing design hazards, including:

- **M-1.3 Traffic Diversion**. Explore discouraging non-local traffic through neighborhoods and diverting traffic to arterial roadways using tools such as traffic control devices, restrictions, speed limits, and other strategies.
- **M-3.1 Transportation Improvements for All Users**. Strive to apply Complete Streets principles to new roadways and to new transportation improvements on City facilities to serve all types of travel (including pedestrians, bicyclists, motorists, public transportation, and goods movement) and all abilities.
- **M-3.2 Eliminating Gaps**. Continue to identify and address gaps in networks serving automobiles, bicyclists, pedestrians, transit users, equestrians, and other users. Remove man-made barriers to accessibility and connectivity.

- **M-3.3 ADA Accessibility**. Ensure the City's transportation network is safe, accessible, and consistent with the Americans with Disabilities Act (ADA), to allow impaired users, such as disabled persons and seniors, to safely travel within and beyond the city.
- **M-3.4 Safe Routes to School**. Work with the Saddleback Valley Unified School District and other schools in the City to establish a Safe Routes to School Program, encouraging parents and children to walk or bike to schools within the city.
- **M-3.5 Context Sensitivity**. Consider the land use and design context of the surrounding areas when designing Complete Streets.
- **M-5.2 Pedestrian Access Between Uses**. Improve pedestrian access between complementary uses such as residential and commercial areas.
- **M-5.4 Effective Roadway Projects**. Consider the implementation of active transportation improvements (such as high visibility crosswalks) when roadways are undergoing rehabilitation, resurfacing, or other modifications.
- **M-6.1 Speeds on Residential Streets**. Explore innovative ways to reduce vehicular speeds through residential neighborhoods to posted speed limits, such as implementing traffic calming strategies.
- **M-6.2 Speeds on Arterial Roadways**. Encourage programming and design strategies to maintain safe vehicular speeds on its arterial roadways.
- **M-6.3 Site Designs and Safety**. Ensure that development projects follow best design practices to reduce conflicts between multiple travel modes.
- **M-6.4 Bicyclist and Pedestrian Safety**. Develop safe and convenient bicycle and pedestrian facilities and crossings at key intersections and other locations.
- **M-6.5 Freeway Ramp Safety**. Encourage Caltrans and the Transportation Corridor Agencies (TCA) to provide safe pedestrian crossings and other facilities at freeway ramps in Lake Forest.
- **M-9.2 Roadway Design**. Maintain roadway design standards along City arterials to facilitate truck access to light industrial, manufacturing, commercial, and mixed-use areas along designated truck routes.

Therefore, the impact of the Plan with respect to design and incompatible use hazards would be considered **less than significant**.

ITEM 5: EMERGENCY ACCESS

The Plan is a programmatic level document; emergency accessibility is typically assessed at the project level. In addition, the Mobility Element developed as part of the General Plan update contains policies in support of emergency access along local roads, including:

- **M-1.2 New Development**. Work with developers to minimize the effects of new development on the local and regional transportation system.
- **M-1.6 Freeway Coordination**. Coordinate with Caltrans and Transportation Corridor Agencies (TCA) on matters such as:
    - Reducing the effects of I-5 and SR-241 ramp operations on City streets

  - Participating in discussions pertaining to ramp improvements currently being studied and any future improvements in the vicinity of Lake Forest
  - Encouraging freeway improvements that would ease local congestion
- **M-2.2 Intersection Capacity**. Monitor and improve capacity at key intersections in the City.
- **M-2.3 Monitoring and Implementing Improvements**. Monitor roadway operations and ensure that LFTM and other appropriate improvements are implemented in a timely manner.
- **M-2.4 Transportation System Efficiency**. Continue to maximize transportation network efficiency and minimize delay and congestion by investing in Traffic System Management (TSM) and signal maintenance and coordination.

Therefore, the impact of the Plan with respect to emergency access would be considered **less than significant**.

ITEM 6: TRANSIT, BICYCLE, OR PEDESTRIAN IMPACTS

The Mobility Element developed as part of the General Plan update contains several policies that support access to and the performance of transit, bicycle, and pedestrian facilities. These policies include:

- **M-3.1 Transportation Improvements for All Users**. Strive to apply Complete Streets principles to new roadways and to new transportation improvements on City facilities to serve all types of travel (including pedestrians, bicyclists, motorists, public transportation, and goods movement) and all abilities.
- **M-3.2 Eliminating Gaps**. Continue to identify and address gaps in networks serving automobiles, bicyclists, pedestrians, transit users, equestrians, and other users. Remove man-made barriers to accessibility and connectivity.
- **M-3.3 ADA Accessibility**. Ensure the City's transportation network is safe, accessible, and consistent with the Americans with Disabilities Act (ADA), to allow impaired users, such as disabled persons and seniors, to safely travel within and beyond the city.
- **M-3.4 Safe Routes to School**. Work with the Saddleback Valley Unified School District and other schools in the City to establish a Safe Routes to School Program, encouraging parents and children to walk or bike to schools within the city.
- **M-4.1 Public Transit Use**. Support programs encouraging public transit use by people living in, working in, or visiting Lake Forest.
- **M-4.2 New Transit Facilities**. Promote the provision of public transit and supportive transit facilities within areas of major development.
- **M-4.3 Improve Local Public Transit Service and Stops**. Work with OCTA to improve local transit service in the City and bus stop amenities along roads that have local transit service.
- **M-4.4 Paratransit Service**. Continue to support OCTA ACCESS paratransit and other special transit services in Lake Forest.
- **M-4.5 Regional Transit Connectivity**. Encourage OCTA to provide access and public transit service between Lake Forest and the Irvine Transportation Center and other regional-serving transportation centers.

- **M-4.6 Metrolink Service**. Monitor and participate in discussions pertaining to Metrolink service to encourage a level of service that meets Lake Forest's needs.
- **M-5.2 Pedestrian Access Between Uses**. Improve pedestrian access between complementary uses such as residential and commercial areas.
- **M-5.4 Effective Roadway Projects**. Consider the implementation of active transportation improvements (such as high visibility crosswalks) when roadways are undergoing rehabilitation, resurfacing, or other modifications.
- **M-5.5 Coordination with Adjacent Jurisdictions**. Coordinate with adjacent jurisdictions to ensure connected and consistent non-vehicular facilities.
- **M-6.3 Site Designs and Safety**. Ensure that development projects follow best design practices to reduce conflicts between multiple travel modes.
- **M-6.4 Bicyclist and Pedestrian Safety**. Develop safe and convenient bicycle and pedestrian facilities and crossings at key intersections and other locations.
- **M-6.5 Freeway Ramp Safety**. Encourage Caltrans and the Transportation Corridor Agencies (TCA) to provide safe pedestrian crossings and other facilities at freeway ramps in Lake Forest.

In addition, the Plan includes mixed-use development that is supportive of non-automotive modes.

Therefore, the impact of the Plan with respect to access to and performance of transit, bicycle, and pedestrian impacts would be considered **less than significant**.

Section 7
Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

This chapter outlines the findings documented in this report.

SIGNIFICANT TRANSPORTATION IMPACTS

The California Environmental Quality Act (CEQA) transportation impact analysis of the Plan found no significant impacts for the following topics:

- Vehicle Miles Traveled (VMT)
- Air Traffic
- Safety Hazards
- Emergency Access
- Public Transit, Bicycle, or Pedestrian Facilities

ROADWAY IMPROVEMENT RECOMMENDATIONS

In addition to the transportation analysis conducted under CEQA requirements, Kittelson analyzed roadway segment and intersection operations with Plan implementation, to address the City's goal of providing satisfactory roadway operations and traffic flow within Lake Forest. Recommended improvements on these facilities were provided to accommodate long-term buildout of vehicular traffic. It is recommended that the City continue to monitor traffic volumes on these and other roadway facilities to determine the timing and extent of any improvements as development projects are implemented in the city.

The three roadway segments with recommended improvements are as follows:

- Portola Parkway
- Bake Parkway
- Lake Forest Drive

The eight intersections with recommended improvements are as follows:

- Portola Parkway & SR-241 Ramps
- Alton Parkway & SR-241 Ramps
- Bake Parkway & Rancho Parkway South
- Bake Parkway & Jeronimo Road
- Lake Forest Drive & Rockfield Boulevard
- Lake Forest Drive & I-5 SB Ramps/Avenida De La Carlota
- Paseo De Valencia & Avenida De La Carlota
- El Toro Road & Bridger Road/I-5 NB Ramps

Appendix 1: Existing Traffic Count Data

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Trabuco Rd W/O Lake Forest Dr

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,354	10,181	21,535

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	21		12		33		12:00	0	0	173		146		319	
00:15	0	0	15		15		30		12:15	0	0	160		152		312	
00:30	0	0	18		9		27		12:30	0	0	137		159		296	
00:45	0	0	14	68	11	47	25	115	12:45	0	0	176	646	174	631	350	1277
01:00	0	0	19		14		33		13:00	0	0	160		165		325	
01:15	0	0	12		11		23		13:15	0	0	136		167		303	
01:30	0	0	4		5		9		13:30	0	0	156		125		281	
01:45	0	0	6	41	2	32	8	73	13:45	0	0	177	629	137	594	314	1223
02:00	0	0	3		5		8		14:00	0	0	196		137		333	
02:15	0	0	5		3		8		14:15	0	0	184		153		337	
02:30	0	0	4		2		6		14:30	0	0	178		188		366	
02:45	0	0	4	16	1	11	5	27	14:45	0	0	215	773	164	642	379	1415
03:00	0	0	7		5		12		15:00	0	0	222		158		380	
03:15	0	0	4		2		6		15:15	0	0	200		208		408	
03:30	0	0	6		10		16		15:30	0	0	212		171		383	
03:45	0	0	8	25	12	29	20	54	15:45	0	0	249	883	183	720	432	1603
04:00	0	0	8		12		20		16:00	0	0	227		152		379	
04:15	0	0	11		7		18		16:15	0	0	228		175		403	
04:30	0	0	17		18		35		16:30	0	0	280		164		444	
04:45	0	0	19	55	34	71	53	126	16:45	0	0	276	1011	187	678	463	1689
05:00	0	0	12		25		37		17:00	0	0	327		192		519	
05:15	0	0	25		27		52		17:15	0	0	323		198		521	
05:30	0	0	33		64		97		17:30	0	0	286		217		503	
05:45	0	0	54	124	75	191	129	315	17:45	0	0	274	1210	173	780	447	1990
06:00	0	0	43		75		118		18:00	0	0	273		172		445	
06:15	0	0	56		91		147		18:15	0	0	260		158		418	
06:30	0	0	93		118		211		18:30	0	0	207		174		381	
06:45	0	0	187	379	139	423	326	802	18:45	0	0	204	944	145	649	349	1593
07:00	0	0	131		190		321		19:00	0	0	164		155		319	
07:15	0	0	138		209		347		19:15	0	0	152		121		273	
07:30	0	0	218		215		433		19:30	0	0	120		117		237	
07:45	0	0	247	734	231	845	478	1579	19:45	0	0	96	532	131	524	227	1056
08:00	0	0	170		216		386		20:00	0	0	107		101		208	
08:15	0	0	225		259		484		20:15	0	0	124		103		227	
08:30	0	0	173		233		406		20:30	0	0	107		103		210	
08:45	0	0	132	700	193	901	325	1601	20:45	0	0	94	432	84	391	178	823
09:00	0	0	131		151		282		21:00	0	0	99		72		171	
09:15	0	0	129		132		261		21:15	0	0	76		100		176	
09:30	0	0	128		133		261		21:30	0	0	72		83		155	
09:45	0	0	130	518	119	535	249	1053	21:45	0	0	66	313	39	294	105	607
10:00	0	0	127		105		232		22:00	0	0	53		59		112	
10:15	0	0	109		123		232		22:15	0	0	46		31		77	
10:30	0	0	109		106		215		22:30	0	0	41		35		76	
10:45	0	0	124	469	120	454	244	923	22:45	0	0	35	175	36	161	71	336
11:00	0	0	123		107		230		23:00	0	0	26		25		51	
11:15	0	0	136		105		241		23:15	0	0	25		34		59	
11:30	0	0	174		130		304		23:30	0	0	32		28		60	
11:45	0	0	147	580	132	474	279	1054	23:45	0	0	14	97	17	104	31	201
TOTALS				3709		4013		**7722**	**TOTALS**				7645		6168		**13813**
SPLIT %				48.0%		52.0%		**35.9%**	**SPLIT %**				55.3%		44.7%		**64.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,354	10,181	21,535

AM Peak Hour			07:30	07:45	**07:30**	**PM Peak Hour**			16:45	16:45	**16:45**
AM Pk Volume			860	939	**1781**	**PM Pk Volume**			1212	794	**2006**
Pk Hr Factor			0.870	0.906	**0.920**	**Pk Hr Factor**			0.927	0.915	**0.963**
7 - 9 Volume	0	0	1434	1746	**3180**	**4 - 6 Volume**	0	0	2221	1458	**3679**
7 - 9 Peak Hour			07:30	07:45	**07:30**	**4 - 6 Peak Hour**			16:45	16:45	**16:45**
7 - 9 Pk Volume	0	0	860	939	**1781**	**4 - 6 Pk Volume**	0	0	1212	794	**2006**
Pk Hr Factor	0.000	0.000	0.870	0.906	**0.920**	**Pk Hr Factor**	0.000	0.000	0.927	0.915	**0.963**

Prepared by NDS/ATD

VOLUME

Trabuco Rd W/O Ridge Route Dr

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,766	10,570	22,336

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			23		10		33		12:00			178		146		324	
00:15			11		11		22		12:15			210		165		375	
00:30			19		15		34		12:30			153		196		349	
00:45			17	70	7	43	24	113	12:45			171	712	188	695	359	1407
01:00			7		3		10		13:00			195		149		344	
01:15			12		2		14		13:15			159		146		305	
01:30			5		2		7		13:30			181		134		315	
01:45			14	38	3	10	17	48	13:45			170	705	163	592	333	1297
02:00			4		7		11		14:00			183		154		337	
02:15			3		4		7		14:15			176		176		352	
02:30			6		4		10		14:30			186		188		374	
02:45			5	18	1	16	6	34	14:45			214	759	162	680	376	1439
03:00			6		2		8		15:00			193		213		406	
03:15			4		4		8		15:15			238		195		433	
03:30			12		12		24		15:30			206		177		383	
03:45			5	27	12	30	17	57	15:45			228	865	145	730	373	1595
04:00			5		12		17		16:00			244		140		384	
04:15			5		15		20		16:15			288		160		448	
04:30			11		22		33		16:30			284		128		412	
04:45			18	39	27	76	45	115	16:45			306	1122	189	617	495	1739
05:00			15		34		49		17:00			338		174		512	
05:15			27		40		67		17:15			353		190		543	
05:30			34		56		90		17:30			363		154		517	
05:45			31	107	88	218	119	325	17:45			356	1410	185	703	541	2113
06:00			32		73		105		18:00			301		154		455	
06:15			53		99		152		18:15			278		174		452	
06:30			57		146		203		18:30			272		153		425	
06:45			79	221	196	514	275	735	18:45			221	1072	147	628	368	1700
07:00			101		203		304		19:00			184		136		320	
07:15			94		259		353		19:15			200		109		309	
07:30			145		245		390		19:30			186		105		291	
07:45			153	493	347	1054	500	1547	19:45			141	711	96	446	237	1157
08:00			151		265		416		20:00			154		86		240	
08:15			155		318		473		20:15			130		85		215	
08:30			140		263		403		20:30			145		84		229	
08:45			128	574	236	1082	364	1656	20:45			120	549	94	349	214	898
09:00			129		176		305		21:00			108		75		183	
09:15			101		141		242		21:15			92		69		161	
09:30			109		149		258		21:30			108		55		163	
09:45			117	456	142	608	259	1064	21:45			65	373	60	259	125	632
10:00			108		157		265		22:00			69		54		123	
10:15			112		156		268		22:15			61		31		92	
10:30			100		114		214		22:30			48		24		72	
10:45			109	429	116	543	225	972	22:45			44	222	21	130	65	352
11:00			148		101		249		23:00			47		24		71	
11:15			187		94		281		23:15			32		18		50	
11:30			156		137		293		23:30			34		17		51	
11:45			169	660	143	475	312	1135	23:45			21	134	13	72	34	206
TOTALS				3132		4669		**7801**	**TOTALS**				8634		5901		**14535**
SPLIT %				40.1%		59.9%		**34.9%**	**SPLIT %**				59.4%		40.6%		**65.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	11,766	10,570	22,336

AM Peak Hour			11:30	07:45	**07:45**	**PM Peak Hour**			17:00	14:30	**17:00**
AM Pk Volume			713	1193	**1792**	**PM Pk Volume**			1410	758	**2113**
Pk Hr Factor			0.849	0.860	**0.896**	**Pk Hr Factor**			0.971	0.890	**0.973**
7 - 9 Volume	0	0	1067	2136	**3203**	**4 - 6 Volume**	0	0	2532	1320	**3852**
7 - 9 Peak Hour			07:30	07:45	**07:45**	**4 - 6 Peak Hour**			17:00	16:45	**17:00**
7 - 9 Pk Volume	0	0	604	1193	**1792**	**4 - 6 Pk Volume**	0	0	1410	707	**2113**
Pk Hr Factor	0.000	0.000	0.974	0.860	**0.896**	**Pk Hr Factor**	0.000	0.000	0.971	0.930	**0.973**

Prepared by NDS/ATD

VOLUME

Trabuco Rd W/O El Toro Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,113	11,994	25,107

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			21		10		31		12:00			199		171		370	
00:15			14		14		28		12:15			219		186		405	
00:30			19		14		33		12:30			234		184		418	
00:45			18	72	9	47	27	119	12:45			198	850	210	751	408	1601
01:00			7		8		15		13:00			203		175		378	
01:15			11		3		14		13:15			172		189		361	
01:30			8		2		10		13:30			201		159		360	
01:45			12	38	4	17	16	55	13:45			184	760	192	715	376	1475
02:00			10		6		16		14:00			186		183		369	
02:15			5		5		10		14:15			234		170		404	
02:30			6		6		12		14:30			198		222		420	
02:45			6	27	2	19	8	46	14:45			238	856	223	798	461	1654
03:00			5		7		12		15:00			249		236		485	
03:15			9		6		15		15:15			287		169		456	
03:30			12		12		24		15:30			237		191		428	
03:45			10	36	15	40	25	76	15:45			238	1011	183	779	421	1790
04:00			6		10		16		16:00			262		187		449	
04:15			8		13		21		16:15			306		202		508	
04:30			13		16		29		16:30			320		163		483	
04:45			20	47	34	73	54	120	16:45			330	1218	220	772	550	1990
05:00			15		27		42		17:00			351		193		544	
05:15			24		39		63		17:15			382		232		614	
05:30			38		63		101		17:30			404		179		583	
05:45			33	110	87	216	120	326	17:45			379	1516	225	829	604	2345
06:00			35		66		101		18:00			358		201		559	
06:15			61		102		163		18:15			327		198		525	
06:30			61		147		208		18:30			312		177		489	
06:45			87	244	200	515	287	759	18:45			265	1262	184	760	449	2022
07:00			113		214		327		19:00			217		174		391	
07:15			98		250		348		19:15			214		130		344	
07:30			153		262		415		19:30			191		139		330	
07:45			222	586	383	1109	605	1695	19:45			155	777	125	568	280	1345
08:00			178		291		469		20:00			168		119		287	
08:15			185		320		505		20:15			150		106		256	
08:30			149		269		418		20:30			169		115		284	
08:45			146	658	258	1138	404	1796	20:45			115	602	115	455	230	1057
09:00			145		185		330		21:00			111		84		195	
09:15			113		154		267		21:15			93		90		183	
09:30			127		164		291		21:30			112		71		183	
09:45			127	512	129	632	256	1144	21:45			67	383	66	311	133	694
10:00			151		151		302		22:00			69		68		137	
10:15			126		147		273		22:15			55		49		104	
10:30			116		133		249		22:30			49		38		87	
10:45			121	514	139	570	260	1084	22:45			40	213	31	186	71	399
11:00			157		136		293		23:00			47		31		78	
11:15			167		132		299		23:15			32		20		52	
11:30			176		171		347		23:30			29		18		47	
11:45			196	696	170	609	366	1305	23:45			17	125	16	85	33	210
TOTALS				3540		4985		8525	TOTALS				9573		7009		16582
SPLIT %				41.5%		58.5%		34.0%	SPLIT %				57.7%		42.3%		66.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,113	11,994	25,107

AM Peak Hour			11:45	07:45	07:45	PM Peak Hour			17:15	14:15	17:15
AM Pk Volume			848	1263	1997	PM Pk Volume			1523	851	2360
Pk Hr Factor			0.906	0.824	0.825	Pk Hr Factor			0.942	0.901	0.961
7 - 9 Volume	0	0	1244	2247	3491	4 - 6 Volume	0	0	2734	1601	4335
7 - 9 Peak Hour			07:30	07:45	07:45	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	738	1263	1997	4 - 6 Pk Volume	0	0	1516	829	2345
Pk Hr Factor	0.000	0.000	0.831	0.824	0.825	Pk Hr Factor	0.000	0.000	0.938	0.893	0.955

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Trabuco Rd E/O El Toro Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,526	11,204	21,730

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	17		12		29		12:00	0	0	157		162		319	
00:15	0	0	13		14		27		12:15	0	0	151		138		289	
00:30	0	0	17		10		27		12:30	0	0	127		199		326	
00:45	0	0	9	56	6	42	15	98	12:45	0	0	132	567	177	676	309	1243
01:00	0	0	7		5		12		13:00	0	0	153		150		303	
01:15	0	0	5		3		8		13:15	0	0	126		160		286	
01:30	0	0	10		0		10		13:30	0	0	135		161		296	
01:45	0	0	8	30	2	10	10	40	13:45	0	0	127	541	191	662	318	1203
02:00	0	0	3		4		7		14:00	0	0	166		157		323	
02:15	0	0	6		5		11		14:15	0	0	180		153		333	
02:30	0	0	2		5		7		14:30	0	0	166		179		345	
02:45	0	0	3	14	2	16	5	30	14:45	0	0	204	716	194	683	398	1399
03:00	0	0	8		3		11		15:00	0	0	217		209		426	
03:15	0	0	1		5		6		15:15	0	0	240		182		422	
03:30	0	0	4		9		13		15:30	0	0	260		185		445	
03:45	0	0	9	22	14	31	23	53	15:45	0	0	208	925	180	756	388	1681
04:00	0	0	5		12		17		16:00	0	0	238		182		420	
04:15	0	0	5		13		18		16:15	0	0	250		156		406	
04:30	0	0	4		32		36		16:30	0	0	278		159		437	
04:45	0	0	13	27	23	80	36	107	16:45	0	0	264	1030	211	708	475	1738
05:00	0	0	4		32		36		17:00	0	0	302		178		480	
05:15	0	0	15		38		53		17:15	0	0	406		185		591	
05:30	0	0	18		66		84		17:30	0	0	323		163		486	
05:45	0	0	23	60	71	207	94	267	17:45	0	0	281	1312	196	722	477	2034
06:00	0	0	22		78		100		18:00	0	0	291		167		458	
06:15	0	0	40		108		148		18:15	0	0	248		160		408	
06:30	0	0	52		128		180		18:30	0	0	235		144		379	
06:45	0	0	62	176	199	513	261	689	18:45	0	0	228	1002	143	614	371	1616
07:00	0	0	107		205		312		19:00	0	0	197		148		345	
07:15	0	0	84		267		351		19:15	0	0	177		141		318	
07:30	0	0	154		261		415		19:30	0	0	145		109		254	
07:45	0	0	203	548	350	1083	553	1631	19:45	0	0	127	646	115	513	242	1159
08:00	0	0	196		339		535		20:00	0	0	129		101		230	
08:15	0	0	159		329		488		20:15	0	0	107		98		205	
08:30	0	0	161		307		468		20:30	0	0	100		95		195	
08:45	0	0	109	625	245	1220	354	1845	20:45	0	0	83	419	90	384	173	803
09:00	0	0	98		170		268		21:00	0	0	75		85		160	
09:15	0	0	87		154		241		21:15	0	0	99		81		180	
09:30	0	0	90		151		241		21:30	0	0	68		62		130	
09:45	0	0	114	389	178	653	292	1042	21:45	0	0	59	301	57	285	116	586
10:00	0	0	85		165		250		22:00	0	0	58		48		106	
10:15	0	0	89		114		203		22:15	0	0	47		55		102	
10:30	0	0	80		121		201		22:30	0	0	37		34		71	
10:45	0	0	108	362	134	534	242	896	22:45	0	0	39	181	25	162	64	343
11:00	0	0	103		139		242		23:00	0	0	30		23		53	
11:15	0	0	122		135		257		23:15	0	0	37		20		57	
11:30	0	0	125		150		275		23:30	0	0	26		16		42	
11:45	0	0	115	465	153	577	268	1042	23:45	0	0	19	112	14	73	33	185
TOTALS				2774		4966		**7740**	**TOTALS**				7752		6238		**13990**
SPLIT %				35.8%		64.2%		**35.6%**	**SPLIT %**				55.4%		44.6%		**64.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,526	11,204	21,730

AM Peak Hour			07:45	07:45	**07:45**	**PM Peak Hour**			17:00	14:45	**17:00**
AM Pk Volume			719	1325	**2044**	**PM Pk Volume**			1312	770	**2034**
Pk Hr Factor			0.885	0.946	**0.924**	**Pk Hr Factor**			0.808	0.921	**0.860**
7 - 9 Volume	0	0	1173	2303	**3476**	**4 - 6 Volume**	0	0	2342	1430	**3772**
7 - 9 Peak Hour			07:45	07:45	**07:45**	**4 - 6 Peak Hour**			17:00	16:45	**17:00**
7 - 9 Pk Volume	0	0	719	1325	**2044**	**4 - 6 Pk Volume**	0	0	1312	737	**2034**
Pk Hr Factor	0.000	0.000	0.885	0.946	**0.924**	**Pk Hr Factor**	0.000	0.000	0.808	0.873	**0.860**

Prepared by NDS/ATD

VOLUME

Toledo Way W/O Lake Forest Dr

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_005

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,555	2,508	6,063

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			10		5		15		12:00			55		34		89	
00:15			3		1		4		12:15			44		41		85	
00:30			2		1		3		12:30			68		40		108	
00:45			3	18	0	7	3	25	12:45			43	210	48	163	91	373
01:00			0		2		2		13:00			43		47		90	
01:15			2		1		3		13:15			41		36		77	
01:30			0		0		0		13:30			45		31		76	
01:45			2	4	0	3	2	7	13:45			42	171	42	156	84	327
02:00			0		0		0		14:00			43		33		76	
02:15			1		0		1		14:15			47		54		101	
02:30			0		2		2		14:30			62		30		92	
02:45			0	1	0	2	0	3	14:45			61	213	32	149	93	362
03:00			0		0		0		15:00			82		63		145	
03:15			0		0		0		15:15			62		53		115	
03:30			2		2		4		15:30			66		46		112	
03:45			1	3	4	6	5	9	15:45			64	274	30	192	94	466
04:00			0		2		2		16:00			65		24		89	
04:15			0		4		4		16:15			75		33		108	
04:30			2		2		4		16:30			105		40		145	
04:45			3	5	11	19	14	24	16:45			107	352	31	128	138	480
05:00			6		5		11		17:00			136		29		165	
05:15			4		6		10		17:15			139		42		181	
05:30			8		19		27		17:30			150		32		182	
05:45			13	31	24	54	37	85	17:45			127	552	37	140	164	692
06:00			10		22		32		18:00			101		33		134	
06:15			11		12		23		18:15			71		30		101	
06:30			16		22		38		18:30			88		17		105	
06:45			22	59	47	103	69	162	18:45			78	338	36	116	114	454
07:00			21		57		78		19:00			50		36		86	
07:15			36		81		117		19:15			45		23		68	
07:30			44		59		103		19:30			62		25		87	
07:45			46	147	100	297	146	444	19:45			40	197	21	105	61	302
08:00			50		111		161		20:00			27		38		65	
08:15			49		104		153		20:15			38		25		63	
08:30			35		56		91		20:30			38		15		53	
08:45			41	175	44	315	85	490	20:45			19	122	19	97	38	219
09:00			21		33		54		21:00			26		22		48	
09:15			46		36		82		21:15			32		16		48	
09:30			34		31		65		21:30			20		10		30	
09:45			42	143	41	141	83	284	21:45			36	114	14	62	50	176
10:00			50		35		85		22:00			34		14		48	
10:15			38		33		71		22:15			10		8		18	
10:30			26		23		49		22:30			12		5		17	
10:45			49	163	11	102	60	265	22:45			10	66	4	31	14	97
11:00			50		26		76		23:00			9		3		12	
11:15			43		26		69		23:15			5		4		9	
11:30			47		21		68		23:30			5		2		7	
11:45			36	176	35	108	71	284	23:45			2	21	3	12	5	33
TOTALS				925		1157		2082	TOTALS				2630		1351		3981
SPLIT %				44.4%		55.6%		34.3%	SPLIT %				66.1%		33.9%		65.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,555	2,508	6,063

AM Peak Hour			11:45	07:30	07:30	PM Peak Hour			17:00	14:45	17:00
AM Pk Volume			203	374	563	PM Pk Volume			552	194	692
Pk Hr Factor			0.746	0.842	0.874	Pk Hr Factor			0.920	0.770	0.951
7 - 9 Volume	0	0	322	612	934	4 - 6 Volume	0	0	904	268	1172
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			17:00	16:30	17:00
7 - 9 Pk Volume	0	0	189	374	563	4 - 6 Pk Volume	0	0	552	142	692
Pk Hr Factor	0.000	0.000	0.945	0.842	0.874	Pk Hr Factor	0.000	0.000	0.920	0.845	0.951

Prepared by NDS/ATD

VOLUME

Toledo Way E/O Lake Forest Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_006

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,202	2,610	5,812

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		2		9		12:00			40		29		69	
00:15			3		0		3		12:15			46		32		78	
00:30			3		0		3		12:30			46		61		107	
00:45			1	14	0	2	1	16	12:45			34	166	47	169	81	335
01:00			3		0		3		13:00			36		33		69	
01:15			1		1		2		13:15			53		24		77	
01:30			0		2		2		13:30			36		33		69	
01:45			1	5	0	3	1	8	13:45			53	178	24	114	77	292
02:00			1		1		2		14:00			57		31		88	
02:15			0		0		0		14:15			55		62		117	
02:30			0		1		1		14:30			57		37		94	
02:45			2	3	0	2	2	5	14:45			55	224	54	184	109	408
03:00			2		0		2		15:00			79		80		159	
03:15			0		1		1		15:15			71		63		134	
03:30			2		3		5		15:30			50		40		90	
03:45			2	6	3	7	5	13	15:45			58	258	35	218	93	476
04:00			0		1		1		16:00			83		39		122	
04:15			2		1		3		16:15			74		23		97	
04:30			5		1		6		16:30			71		30		101	
04:45			1	8	6	9	7	17	16:45			86	314	31	123	117	437
05:00			2		12		14		17:00			119		26		145	
05:15			1		15		16		17:15			152		28		180	
05:30			3		20		23		17:30			94		28		122	
05:45			4	10	24	71	28	81	17:45			116	481	36	118	152	599
06:00			8		22		30		18:00			77		35		112	
06:15			14		20		34		18:15			69		23		92	
06:30			27		35		62		18:30			78		39		117	
06:45			48	97	79	156	127	253	18:45			64	288	25	122	89	410
07:00			41		102		143		19:00			61		26		87	
07:15			35		81		116		19:15			41		23		64	
07:30			62		84		146		19:30			44		20		64	
07:45			84	222	125	392	209	614	19:45			30	176	18	87	48	263
08:00			49		110		159		20:00			40		23		63	
08:15			41		99		140		20:15			36		13		49	
08:30			24		54		78		20:30			35		12		47	
08:45			33	147	54	317	87	464	20:45			31	142	10	58	41	200
09:00			16		28		44		21:00			28		15		43	
09:15			19		32		51		21:15			25		21		46	
09:30			25		25		50		21:30			25		13		38	
09:45			16	76	30	115	46	191	21:45			23	101	10	59	33	160
10:00			19		39		58		22:00			16		5		21	
10:15			24		32		56		22:15			16		9		25	
10:30			31		25		56		22:30			11		9		20	
10:45			27	101	25	121	52	222	22:45			10	53	13	36	23	89
11:00			21		17		38		23:00			13		6		19	
11:15			14		20		34		23:15			8		8		16	
11:30			30		26		56		23:30			4		8		12	
11:45			35	100	32	95	67	195	23:45			7	32	10	32	17	64
TOTALS				789		1290		2079	TOTALS				2413		1320		3733
SPLIT %				38.0%		62.0%		35.8%	SPLIT %				64.6%		35.4%		64.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,202	2,610	5,812

AM Peak Hour			07:30	07:30	07:30	PM Peak Hour			17:00	14:45	17:00
AM Pk Volume			236	418	654	PM Pk Volume			481	237	599
Pk Hr Factor			0.702	0.836	0.782	Pk Hr Factor			0.791	0.741	0.832
7 - 9 Volume	0	0	369	709	1078	4 - 6 Volume	0	0	795	241	1036
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			17:00	16:00	17:00
7 - 9 Pk Volume	0	0	236	418	654	4 - 6 Pk Volume	0	0	481	123	599
Pk Hr Factor	0.000	0.000	0.702	0.836	0.782	Pk Hr Factor	0.000	0.000	0.791	0.788	0.832

Prepared by NDS/ATD

VOLUME

Toledo Way E/O Ridge Route Dr

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_007

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,289	2,696	5,985

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			4		1		5		12:00			35		24		59	
00:15			2		1		3		12:15			43		44		87	
00:30			2		2		4		12:30			61		83		144	
00:45			1	9	0	4	1	13	12:45			41	180	33	184	74	364
01:00			1		1		2		13:00			44		43		87	
01:15			0		0		0		13:15			47		48		95	
01:30			0		1		1		13:30			34		57		91	
01:45			2	3	0	2	2	5	13:45			35	160	61	209	96	369
02:00			1		0		1		14:00			56		41		97	
02:15			1		1		2		14:15			70		67		137	
02:30			0		1		1		14:30			51		34		85	
02:45			0	2	0	2	0	4	14:45			61	238	36	178	97	416
03:00			1		0		1		15:00			147		121		268	
03:15			1		0		1		15:15			106		83		189	
03:30			1		0		1		15:30			66		44		110	
03:45			0	3	1	1	1	4	15:45			59	378	24	272	83	650
04:00			0		1		1		16:00			59		35		94	
04:15			1		2		3		16:15			56		28		84	
04:30			1		1		2		16:30			83		41		124	
04:45			2	4	6	10	8	14	16:45			71	269	31	135	102	404
05:00			0		4		4		17:00			102		44		146	
05:15			1		3		4		17:15			128		39		167	
05:30			2		13		15		17:30			128		47		175	
05:45			2	5	11	31	13	36	17:45			108	466	45	175	153	641
06:00			4		11		15		18:00			87		30		117	
06:15			9		11		20		18:15			50		32		82	
06:30			9		18		27		18:30			71		23		94	
06:45			20	42	33	73	53	115	18:45			72	280	40	125	112	405
07:00			29		42		71		19:00			44		40		84	
07:15			30		52		82		19:15			35		44		79	
07:30			62		77		139		19:30			31		40		71	
07:45			144	265	120	291	264	556	19:45			28	138	46	170	74	308
08:00			63		71		134		20:00			28		55		83	
08:15			44		68		112		20:15			16		21		37	
08:30			34		36		70		20:30			27		13		40	
08:45			21	162	35	210	56	372	20:45			27	98	16	105	43	203
09:00			19		29		48		21:00			29		25		54	
09:15			24		23		47		21:15			27		25		52	
09:30			26		32		58		21:30			21		24		45	
09:45			71	140	53	137	124	277	21:45			15	92	12	86	27	178
10:00			115		94		209		22:00			16		4		20	
10:15			47		63		110		22:15			6		7		13	
10:30			18		16		34		22:30			7		6		13	
10:45			24	204	16	189	40	393	22:45			8	37	3	20	11	57
11:00			31		19		50		23:00			3		3		6	
11:15			17		19		36		23:15			4		6		10	
11:30			27		20		47		23:30			3		2		5	
11:45			24	99	16	74	40	173	23:45			5	15	2	13	7	28
TOTALS				938		1024		1962	TOTALS				2351		1672		4023
SPLIT %				47.8%		52.2%		32.8%	SPLIT %				58.4%		41.6%		67.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,289	2,696	5,985

AM Peak Hour			07:30	07:30	07:30	PM Peak Hour			17:00	14:45	14:45
AM Pk Volume			313	336	649	PM Pk Volume			466	284	664
Pk Hr Factor			0.543	0.700	0.615	Pk Hr Factor			0.910	0.587	0.619
7 - 9 Volume	0	0	427	501	928	4 - 6 Volume	0	0	735	310	1045
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	313	336	649	4 - 6 Pk Volume	0	0	466	175	641
Pk Hr Factor	0.000	0.000	0.543	0.700	0.615	Pk Hr Factor	0.000	0.000	0.910	0.931	0.916

Prepared by NDS/ATD

VOLUME

Jeronimo Rd W/O Lake Forest Dr

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_008

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,633	6,849	13,482

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			9		3		12		12:00			98		86		184	
00:15			9		5		14		12:15			121		98		219	
00:30			8		3		11		12:30			89		125		214	
00:45			6	32	3	14	9	46	12:45			82	390	107	416	189	806
01:00			2		3		5		13:00			66		124		190	
01:15			3		2		5		13:15			79		104		183	
01:30			4		6		10		13:30			66		117		183	
01:45			6	15	3	14	9	29	13:45			73	284	80	425	153	709
02:00			7		5		12		14:00			97		90		187	
02:15			5		2		7		14:15			83		91		174	
02:30			3		3		6		14:30			109		83		192	
02:45			4	19	4	14	8	33	14:45			110	399	75	339	185	738
03:00			3		2		5		15:00			122		112		234	
03:15			2		2		4		15:15			101		85		186	
03:30			4		5		9		15:30			126		90		216	
03:45			3	12	5	14	8	26	15:45			144	493	82	369	226	862
04:00			4		6		10		16:00			165		61		226	
04:15			2		10		12		16:15			185		66		251	
04:30			6		17		23		16:30			212		84		296	
04:45			4	16	21	54	25	70	16:45			213	775	58	269	271	1044
05:00			3		18		21		17:00			262		84		346	
05:15			9		30		39		17:15			326		73		399	
05:30			7		46		53		17:30			277		63		340	
05:45			14	33	77	171	91	204	17:45			231	1096	75	295	306	1391
06:00			10		77		87		18:00			200		66		266	
06:15			28		103		131		18:15			194		68		262	
06:30			24		129		153		18:30			172		77		249	
06:45			17	79	171	480	188	559	18:45			136	702	48	259	184	961
07:00			40		192		232		19:00			98		68		166	
07:15			41		234		275		19:15			121		59		180	
07:30			71		219		290		19:30			74		63		137	
07:45			90	242	270	915	360	1157	19:45			69	362	51	241	120	603
08:00			72		250		322		20:00			77		41		118	
08:15			51		280		331		20:15			73		50		123	
08:30			56		195		251		20:30			63		35		98	
08:45			65	244	212	937	277	1181	20:45			57	270	39	165	96	435
09:00			43		161		204		21:00			66		31		97	
09:15			55		146		201		21:15			52		42		94	
09:30			49		151		200		21:30			48		34		82	
09:45			57	204	103	561	160	765	21:45			46	212	24	131	70	343
10:00			52		94		146		22:00			49		24		73	
10:15			52		106		158		22:15			28		18		46	
10:30			54		78		132		22:30			29		14		43	
10:45			60	218	72	350	132	568	22:45			32	138	10	66	42	204
11:00			77		77		154		23:00			21		14		35	
11:15			74		71		145		23:15			15		10		25	
11:30			91		83		174		23:30			16		7		23	
11:45			92	334	83	314	175	648	23:45			12	64	5	36	17	100
TOTALS				1448		3838		5286	TOTALS				5185		3011		8196
SPLIT %				27.4%		72.6%		39.2%	SPLIT %				63.3%		36.7%		60.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,633	6,849	13,482

AM Peak Hour			11:30	07:30	07:30	PM Peak Hour			17:00	12:30	17:00
AM Pk Volume			402	1019	1303	PM Pk Volume			1096	460	1391
Pk Hr Factor			0.831	0.910	0.905	Pk Hr Factor			0.840	0.920	0.872
7 - 9 Volume	0	0	486	1852	2338	4 - 6 Volume	0	0	1871	564	2435
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			17:00	16:30	17:00
7 - 9 Pk Volume	0	0	284	1019	1303	4 - 6 Pk Volume	0	0	1096	299	1391
Pk Hr Factor	0.000	0.000	0.789	0.910	0.905	Pk Hr Factor	0.000	0.000	0.840	0.890	0.872

Prepared by NDS/ATD

VOLUME

Jeronimo Rd W/O Ridge Route Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_009

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,190	6,159	13,349

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			10		11		21		12:00			129		81		210	
00:15			8		5		13		12:15			78		74		152	
00:30			4		4		8		12:30			67		98		165	
00:45			5	27	4	24	9	51	12:45			97	371	103	356	200	727
01:00			4		2		6		13:00			74		113		187	
01:15			4		0		4		13:15			81		97		178	
01:30			2		2		4		13:30			105		116		221	
01:45			4	14	3	7	7	21	13:45			95	355	114	440	209	795
02:00			3		2		5		14:00			84		135		219	
02:15			2		3		5		14:15			103		96		199	
02:30			1		2		3		14:30			111		100		211	
02:45			3	9	1	8	4	17	14:45			125	423	102	433	227	856
03:00			0		2		2		15:00			325		64		389	
03:15			3		4		7		15:15			174		83		257	
03:30			2		2		4		15:30			171		84		255	
03:45			3	8	5	13	8	21	15:45			163	833	101	332	264	1165
04:00			4		6		10		16:00			173		101		274	
04:15			4		7		11		16:15			212		62		274	
04:30			7		8		15		16:30			221		86		307	
04:45			3	18	13	34	16	52	16:45			205	811	75	324	280	1135
05:00			3		10		13		17:00			268		87		355	
05:15			5		17		22		17:15			283		92		375	
05:30			4		30		34		17:30			259		88		347	
05:45			14	26	31	88	45	114	17:45			226	1036	85	352	311	1388
06:00			19		40		59		18:00			204		75		279	
06:15			17		58		75		18:15			182		84		266	
06:30			26		92		118		18:30			138		59		197	
06:45			38	100	128	318	166	418	18:45			114	638	63	281	177	919
07:00			63		156		219		19:00			95		62		157	
07:15			52		161		213		19:15			91		49		140	
07:30			82		179		261		19:30			61		61		122	
07:45			164	361	298	794	462	1155	19:45			67	314	43	215	110	529
08:00			239		285		524		20:00			78		37		115	
08:15			91		231		322		20:15			72		44		116	
08:30			72		157		229		20:30			47		42		89	
08:45			60	462	148	821	208	1283	20:45			44	241	41	164	85	405
09:00			49		111		160		21:00			49		38		87	
09:15			55		100		155		21:15			47		21		68	
09:30			56		84		140		21:30			38		26		64	
09:45			57	217	96	391	153	608	21:45			34	168	18	103	52	271
10:00			50		67		117		22:00			47		15		62	
10:15			64		59		123		22:15			21		15		36	
10:30			75		69		144		22:30			12		18		30	
10:45			67	256	73	268	140	524	22:45			24	104	14	62	38	166
11:00			63		70		133		23:00			11		15		26	
11:15			99		76		175		23:15			8		11		19	
11:30			100		79		179		23:30			12		6		18	
11:45			93	355	70	295	163	650	23:45			12	43	4	36	16	79
TOTALS				1853		3061		4914	TOTALS				5337		3098		8435
SPLIT %				37.7%		62.3%		36.8%	SPLIT %				63.3%		36.7%		63.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,190	6,159	13,349

AM Peak Hour			07:30	07:30	07:30	PM Peak Hour			17:00	13:15	17:00
AM Pk Volume			576	993	1569	PM Pk Volume			1036	462	1388
Pk Hr Factor			0.603	0.833	0.749	Pk Hr Factor			0.915	0.856	0.925
7 - 9 Volume	0	0	823	1615	2438	4 - 6 Volume	0	0	1847	676	2523
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	576	993	1569	4 - 6 Pk Volume	0	0	1036	352	1388
Pk Hr Factor	0.000	0.000	0.603	0.833	0.749	Pk Hr Factor	0.000	0.000	0.915	0.957	0.925

Prepared by NDS/ATD

VOLUME

Jeronimo Rd W/O El Toro Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_010

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,563	6,796	14,359

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			8		13		21		12:00			91		100		191	
00:15			7		9		16		12:15			109		96		205	
00:30			4		5		9		12:30			117		107		224	
00:45			4	23	6	33	10	56	12:45			104	421	117	420	221	841
01:00			6		2		8		13:00			96		107		203	
01:15			11		1		12		13:15			75		107		182	
01:30			1		3		4		13:30			97		135		232	
01:45			2	20	3	9	5	29	13:45			103	371	142	491	245	862
02:00			2		3		5		14:00			168		143		311	
02:15			1		3		4		14:15			162		112		274	
02:30			0		2		2		14:30			132		103		235	
02:45			1	4	2	10	3	14	14:45			133	595	115	473	248	1068
03:00			2		3		5		15:00			129		92		221	
03:15			5		4		9		15:15			164		87		251	
03:30			5		1		6		15:30			166		90		256	
03:45			7	19	5	13	12	32	15:45			159	618	109	378	268	996
04:00			7		3		10		16:00			195		114		309	
04:15			7		6		13		16:15			204		105		309	
04:30			8		4		12		16:30			190		105		295	
04:45			6	28	14	27	20	55	16:45			189	778	101	425	290	1203
05:00			10		12		22		17:00			259		103		362	
05:15			11		14		25		17:15			263		130		393	
05:30			13		22		35		17:30			259		107		366	
05:45			19	53	29	77	48	130	17:45			236	1017	110	450	346	1467
06:00			28		22		50		18:00			171		97		268	
06:15			35		61		96		18:15			197		96		293	
06:30			39		66		105		18:30			135		91		226	
06:45			51	153	118	267	169	420	18:45			101	604	78	362	179	966
07:00			72		126		198		19:00			116		85		201	
07:15			81		155		236		19:15			104		80		184	
07:30			107		181		288		19:30			80		94		174	
07:45			159	419	275	737	434	1156	19:45			63	363	52	311	115	674
08:00			177		268		445		20:00			62		54		116	
08:15			147		195		342		20:15			55		70		125	
08:30			110		168		278		20:30			53		55		108	
08:45			107	541	130	761	237	1302	20:45			59	229	58	237	117	466
09:00			95		123		218		21:00			64		52		116	
09:15			86		92		178		21:15			50		25		75	
09:30			75		86		161		21:30			28		39		67	
09:45			81	337	100	401	181	738	21:45			30	172	23	139	53	311
10:00			81		80		161		22:00			19		21		40	
10:15			73		71		144		22:15			25		26		51	
10:30			70		72		142		22:30			11		22		33	
10:45			87	311	84	307	171	618	22:45			18	73	12	81	30	154
11:00			80		80		160		23:00			15		12		27	
11:15			66		88		154		23:15			13		10		23	
11:30			85		113		198		23:30			10		8		18	
11:45			132	363	72	353	204	716	23:45			13	51	4	34	17	85
TOTALS				2271		2995		5266	TOTALS				5292		3801		9093
SPLIT %				43.1%		56.9%		36.7%	SPLIT %				58.2%		41.8%		63.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,563	6,796	14,359

AM Peak Hour			07:45	07:30	07:30	PM Peak Hour			17:00	13:30	17:00
AM Pk Volume			593	919	1509	PM Pk Volume			1017	532	1467
Pk Hr Factor			0.838	0.835	0.848	Pk Hr Factor			0.967	0.930	0.933
7 - 9 Volume	0	0	960	1498	2458	4 - 6 Volume	0	0	1795	875	2670
7 - 9 Peak Hour			07:45	07:30	07:30	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	593	919	1509	4 - 6 Pk Volume	0	0	1017	450	1467
Pk Hr Factor	0.000	0.000	0.838	0.835	0.848	Pk Hr Factor	0.000	0.000	0.967	0.865	0.933

Prepared by NDS/ATD

VOLUME

Jeronimo Rd E/O El Toro Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_011

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,790	10,858	21,648

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			18		16		34		12:00			160		140		300	
00:15			8		7		15		12:15			170		168		338	
00:30			6		5		11		12:30			164		159		323	
00:45			9	41	5	33	14	74	12:45			174	668	191	658	365	1326
01:00			8		4		12		13:00			138		194		332	
01:15			7		6		13		13:15			181		196		377	
01:30			4		7		11		13:30			156		171		327	
01:45			7	26	7	24	14	50	13:45			163	638	173	734	336	1372
02:00			2		6		8		14:00			178		188		366	
02:15			4		5		9		14:15			189		174		363	
02:30			2		1		3		14:30			207		173		380	
02:45			4	12	2	14	6	26	14:45			189	763	179	714	368	1477
03:00			6		8		14		15:00			204		171		375	
03:15			7		4		11		15:15			216		177		393	
03:30			7		4		11		15:30			236		146		382	
03:45			7	27	8	24	15	51	15:45			241	897	201	695	442	1592
04:00			4		6		10		16:00			265		194		459	
04:15			7		18		25		16:15			258		160		418	
04:30			5		10		15		16:30			273		176		449	
04:45			10	26	19	53	29	79	16:45			271	1067	185	715	456	1782
05:00			9		26		35		17:00			329		179		508	
05:15			10		35		45		17:15			334		191		525	
05:30			22		47		69		17:30			334		189		523	
05:45			36	77	42	150	78	227	17:45			301	1298	167	726	468	2024
06:00			26		48		74		18:00			274		153		427	
06:15			51		93		144		18:15			262		160		422	
06:30			59		125		184		18:30			175		157		332	
06:45			60	196	173	439	233	635	18:45			163	874	144	614	307	1488
07:00			86		183		269		19:00			170		121		291	
07:15			89		222		311		19:15			136		128		264	
07:30			131		269		400		19:30			112		151		263	
07:45			193	499	373	1047	566	1546	19:45			105	523	112	512	217	1035
08:00			176		306		482		20:00			114		126		240	
08:15			202		329		531		20:15			107		112		219	
08:30			189		248		437		20:30			96		93		189	
08:45			156	723	202	1085	358	1808	20:45			89	406	104	435	193	841
09:00			134		166		300		21:00			71		94		165	
09:15			122		157		279		21:15			72		54		126	
09:30			132		129		261		21:30			50		59		109	
09:45			116	504	132	584	248	1088	21:45			70	263	47	254	117	517
10:00			120		149		269		22:00			31		43		74	
10:15			134		128		262		22:15			41		47		88	
10:30			132		128		260		22:30			26		32		58	
10:45			128	514	136	541	264	1055	22:45			25	123	26	148	51	271
11:00			126		156		282		23:00			25		26		51	
11:15			119		151		270		23:15			19		15		34	
11:30			125		158		283		23:30			13		13		26	
11:45			174	544	126	591	300	1135	23:45			24	81	14	68	38	149
TOTALS				3189		4585		7774	TOTALS				7601		6273		13874
SPLIT %				41.0%		59.0%		35.9%	SPLIT %				54.8%		45.2%		64.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,790	10,858	21,648

AM Peak Hour			07:45	07:30	07:45	PM Peak Hour			17:00	12:45	17:00
AM Pk Volume			760	1277	2016	PM Pk Volume			1298	752	2024
Pk Hr Factor			0.941	0.856	0.890	Pk Hr Factor			0.972	0.959	0.964
7 - 9 Volume	0	0	1222	2132	3354	4 - 6 Volume	0	0	2365	1441	3806
7 - 9 Peak Hour			07:45	07:30	07:45	4 - 6 Peak Hour			17:00	16:45	17:00
7 - 9 Pk Volume	0	0	760	1277	2016	4 - 6 Pk Volume	0	0	1298	744	2024
Pk Hr Factor	0.000	0.000	0.941	0.856	0.890	Pk Hr Factor	0.000	0.000	0.972	0.974	0.964

Prepared by NDS/ATD

VOLUME

Muirlands Blvd W/O Lake Forest Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_012

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,045	5,891	13,936

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		5		12		12:00			208		94		302	
00:15			7		7		14		12:15			172		139		311	
00:30			4		5		9		12:30			155		123		278	
00:45			10	28	3	20	13	48	12:45			149	684	121	477	270	1161
01:00			1		4		5		13:00			127		109		236	
01:15			7		2		9		13:15			128		119		247	
01:30			5		1		6		13:30			107		104		211	
01:45			2	15	3	10	5	25	13:45			132	494	90	422	222	916
02:00			1		2		3		14:00			94		88		182	
02:15			3		2		5		14:15			103		74		177	
02:30			1		2		3		14:30			139		99		238	
02:45			5	10	2	8	7	18	14:45			131	467	91	352	222	819
03:00			0		2		2		15:00			152		96		248	
03:15			0		4		4		15:15			163		92		255	
03:30			6		6		12		15:30			147		85		232	
03:45			7	13	7	19	14	32	15:45			158	620	73	346	231	966
04:00			4		7		11		16:00			188		63		251	
04:15			2		13		15		16:15			239		65		304	
04:30			2		15		17		16:30			231		70		301	
04:45			10	18	38	73	48	91	16:45			231	889	73	271	304	1160
05:00			3		22		25		17:00			273		74		347	
05:15			3		20		23		17:15			298		61		359	
05:30			16		27		43		17:30			259		67		326	
05:45			14	36	43	112	57	148	17:45			274	1104	57	259	331	1363
06:00			21		69		90		18:00			273		61		334	
06:15			16		111		127		18:15			213		65		278	
06:30			36		76		112		18:30			168		49		217	
06:45			30	103	98	354	128	457	18:45			153	807	59	234	212	1041
07:00			49		110		159		19:00			154		53		207	
07:15			61		159		220		19:15			95		38		133	
07:30			74		169		243		19:30			84		56		140	
07:45			65	249	173	611	238	860	19:45			73	406	35	182	108	588
08:00			67		225		292		20:00			71		45		116	
08:15			78		194		272		20:15			58		36		94	
08:30			62		206		268		20:30			62		29		91	
08:45			81	288	143	768	224	1056	20:45			44	235	21	131	65	366
09:00			89		117		206		21:00			42		22		64	
09:15			73		99		172		21:15			57		25		82	
09:30			81		117		198		21:30			40		23		63	
09:45			94	337	108	441	202	778	21:45			31	170	11	81	42	251
10:00			89		82		171		22:00			33		10		43	
10:15			73		84		157		22:15			20		11		31	
10:30			82		79		161		22:30			17		11		28	
10:45			87	331	79	324	166	655	22:45			18	88	7	39	25	127
11:00			147		79		226		23:00			13		7		20	
11:15			127		76		203		23:15			12		5		17	
11:30			156		88		244		23:30			12		3		15	
11:45			182	612	97	340	279	952	23:45			4	41	2	17	6	58
TOTALS				2040		3080		5120	TOTALS				6005		2811		8816
SPLIT %				39.8%		60.2%		36.7%	SPLIT %				68.1%		31.9%		63.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,045	5,891	13,936

AM Peak Hour			11:30	07:45	11:45	PM Peak Hour			17:00	12:15	17:00
AM Pk Volume			718	798	1170	PM Pk Volume			1104	492	1363
Pk Hr Factor			0.863	0.887	0.941	Pk Hr Factor			0.926	0.885	0.949
7 - 9 Volume	0	0	537	1379	1916	4 - 6 Volume	0	0	1993	530	2523
7 - 9 Peak Hour			08:00	07:45	07:45	4 - 6 Peak Hour			17:00	16:15	17:00
7 - 9 Pk Volume	0	0	288	798	1070	4 - 6 Pk Volume	0	0	1104	282	1363
Pk Hr Factor	0.000	0.000	0.889	0.887	0.916	Pk Hr Factor	0.000	0.000	0.926	0.953	0.949

Prepared by NDS/ATD

VOLUME

Muirlands Blvd W/O Ridge Route Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_013

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,957	8,223	17,180

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			9		10		19		12:00			166		135		301	
00:15			14		9		23		12:15			164		154		318	
00:30			5		5		10		12:30			156		151		307	
00:45			11	39	5	29	16	68	12:45			147	633	149	589	296	1222
01:00			3		14		17		13:00			129		150		279	
01:15			9		3		12		13:15			134		141		275	
01:30			5		4		9		13:30			114		122		236	
01:45			5	22	4	25	9	47	13:45			160	537	123	536	283	1073
02:00			0		3		3		14:00			136		147		283	
02:15			3		7		10		14:15			140		123		263	
02:30			2		1		3		14:30			137		152		289	
02:45			3	8	5	16	8	24	14:45			196	609	133	555	329	1164
03:00			5		3		8		15:00			183		154		337	
03:15			6		4		10		15:15			184		159		343	
03:30			8		8		16		15:30			163		138		301	
03:45			5	24	7	22	12	46	15:45			173	703	129	580	302	1283
04:00			4		10		14		16:00			218		120		338	
04:15			2		10		12		16:15			244		126		370	
04:30			4		18		22		16:30			251		127		378	
04:45			8	18	33	71	41	89	16:45			244	957	113	486	357	1443
05:00			10		25		35		17:00			245		143		388	
05:15			7		19		26		17:15			338		143		481	
05:30			11		31		42		17:30			285		125		410	
05:45			17	45	40	115	57	160	17:45			269	1137	130	541	399	1678
06:00			26		33		59		18:00			282		106		388	
06:15			20		75		95		18:15			239		111		350	
06:30			39		81		120		18:30			208		93		301	
06:45			48	133	126	315	174	448	18:45			168	897	98	408	266	1305
07:00			64		147		211		19:00			187		100		287	
07:15			76		180		256		19:15			121		81		202	
07:30			87		192		279		19:30			104		75		179	
07:45			107	334	241	760	348	1094	19:45			86	498	86	342	172	840
08:00			116		269		385		20:00			85		86		171	
08:15			108		236		344		20:15			70		85		155	
08:30			89		242		331		20:30			79		54		133	
08:45			100	413	153	900	253	1313	20:45			59	293	46	271	105	564
09:00			90		117		207		21:00			44		61		105	
09:15			86		124		210		21:15			57		33		90	
09:30			78		123		201		21:30			40		34		74	
09:45			106	360	115	479	221	839	21:45			45	186	34	162	79	348
10:00			94		107		201		22:00			36		28		64	
10:15			104		117		221		22:15			26		23		49	
10:30			84		107		191		22:30			29		22		51	
10:45			107	389	95	426	202	815	22:45			27	118	14	87	41	205
11:00			124		111		235		23:00			20		14		34	
11:15			109		103		212		23:15			27		18		45	
11:30			160		125		285		23:30			21		20		41	
11:45			129	522	106	445	235	967	23:45			14	82	11	63	25	145
TOTALS				2307		3603		5910	TOTALS				6650		4620		11270
SPLIT %				39.0%		61.0%		34.4%	SPLIT %				59.0%		41.0%		65.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,957	8,223	17,180

AM Peak Hour			11:30	07:45	07:45	PM Peak Hour			17:15	12:15	17:00
AM Pk Volume			619	988	1408	PM Pk Volume			1174	604	1678
Pk Hr Factor			0.932	0.918	0.914	Pk Hr Factor			0.868	0.981	0.872
7 - 9 Volume	0	0	747	1660	2407	4 - 6 Volume	0	0	2094	1027	3121
7 - 9 Peak Hour			07:45	07:45	07:45	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	420	988	1408	4 - 6 Pk Volume	0	0	1137	541	1678
Pk Hr Factor	0.000	0.000	0.905	0.918	0.914	Pk Hr Factor	0.000	0.000	0.841	0.946	0.872

Prepared by NDS/ATD

VOLUME

Muirlands Blvd E/O Ridge Route Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_014

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,618	8,960	19,578

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		10		17		12:00			150		141		291	
00:15			17		9		26		12:15			192		136		328	
00:30			9		5		14		12:30			183		151		334	
00:45			16	49	2	26	18	75	12:45			160	685	157	585	317	1270
01:00			2		9		11		13:00			185		147		332	
01:15			8		2		10		13:15			153		155		308	
01:30			7		5		12		13:30			145		148		293	
01:45			6	23	2	18	8	41	13:45			185	668	132	582	317	1250
02:00			2		1		3		14:00			150		154		304	
02:15			3		5		8		14:15			156		145		301	
02:30			4		2		6		14:30			173		156		329	
02:45			3	12	6	14	9	26	14:45			247	726	155	610	402	1336
03:00			2		1		3		15:00			202		169		371	
03:15			2		3		5		15:15			226		189		415	
03:30			11		7		18		15:30			208		144		352	
03:45			4	19	5	16	9	35	15:45			216	852	155	657	371	1509
04:00			3		9		12		16:00			246		153		399	
04:15			3		9		12		16:15			262		141		403	
04:30			5		19		24		16:30			295		148		443	
04:45			8	19	37	74	45	93	16:45			277	1080	150	592	427	1672
05:00			11		21		32		17:00			286		138		424	
05:15			9		18		27		17:15			358		157		515	
05:30			14		33		47		17:30			313		146		459	
05:45			23	57	47	119	70	176	17:45			331	1288	142	583	473	1871
06:00			31		40		71		18:00			308		127		435	
06:15			31		77		108		18:15			298		114		412	
06:30			49		95		144		18:30			246		100		346	
06:45			63	174	131	343	194	517	18:45			206	1058	110	451	316	1509
07:00			78		165		243		19:00			219		117		336	
07:15			97		206		303		19:15			146		95		241	
07:30			105		190		295		19:30			125		85		210	
07:45			126	406	272	833	398	1239	19:45			109	599	95	392	204	991
08:00			135		295		430		20:00			111		81		192	
08:15			133		291		424		20:15			95		85		180	
08:30			129		252		381		20:30			101		61		162	
08:45			128	525	171	1009	299	1534	20:45			86	393	51	278	137	671
09:00			116		133		249		21:00			80		55		135	
09:15			101		148		249		21:15			72		37		109	
09:30			94		132		226		21:30			78		41		119	
09:45			112	423	139	552	251	975	21:45			70	300	31	164	101	464
10:00			110		117		227		22:00			48		36		84	
10:15			102		113		215		22:15			35		23		58	
10:30			94		116		210		22:30			40		24		64	
10:45			135	441	106	452	241	893	22:45			41	164	13	96	54	260
11:00			131		117		248		23:00			24		15		39	
11:15			118		109		227		23:15			32		11		43	
11:30			160		126		286		23:30			25		11		36	
11:45			155	564	112	464	267	1028	23:45			12	93	13	50	25	143
TOTALS				2712		3920		6632	TOTALS				7906		5040		12946
SPLIT %				40.9%		59.1%		33.9%	SPLIT %				61.1%		38.9%		66.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,618	8,960	19,578

AM Peak Hour			11:45	07:45	07:45	PM Peak Hour			17:15	14:30	17:15
AM Pk Volume			680	1110	1633	PM Pk Volume			1310	669	1882
Pk Hr Factor			0.885	0.941	0.949	Pk Hr Factor			0.915	0.885	0.914
7 - 9 Volume	0	0	931	1842	2773	4 - 6 Volume	0	0	2368	1175	3543
7 - 9 Peak Hour			08:00	07:45	07:45	4 - 6 Peak Hour			17:00	16:30	17:00
7 - 9 Pk Volume	0	0	525	1110	1633	4 - 6 Pk Volume	0	0	1288	593	1871
Pk Hr Factor	0.000	0.000	0.972	0.941	0.949	Pk Hr Factor	0.000	0.000	0.899	0.944	0.908

Prepared by NDS/ATD

VOLUME

Muirlands Blvd E/O El Toro Rd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_015

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,977	9,732	20,709

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			10		16		26		12:00			160		151		311	
00:15			12		12		24		12:15			167		146		313	
00:30			7		11		18		12:30			163		152		315	
00:45			12	41	10	49	22	90	12:45			144	634	130	579	274	1213
01:00			8		2		10		13:00			132		147		279	
01:15			8		4		12		13:15			155		111		266	
01:30			4		6		10		13:30			153		137		290	
01:45			8	28	5	17	13	45	13:45			180	620	131	526	311	1146
02:00			2		6		8		14:00			155		133		288	
02:15			2		9		11		14:15			159		157		316	
02:30			3		2		5		14:30			234		124		358	
02:45			7	14	8	25	15	39	14:45			214	762	156	570	370	1332
03:00			3		7		10		15:00			225		242		467	
03:15			3		5		8		15:15			228		205		433	
03:30			5		7		12		15:30			212		173		385	
03:45			6	17	9	28	15	45	15:45			227	892	171	791	398	1683
04:00			12		10		22		16:00			257		162		419	
04:15			9		10		19		16:15			285		168		453	
04:30			10		13		23		16:30			241		172		413	
04:45			11	42	32	65	43	107	16:45			292	1075	217	719	509	1794
05:00			14		20		34		17:00			304		164		468	
05:15			18		25		43		17:15			323		179		502	
05:30			27		29		56		17:30			307		180		487	
05:45			34	93	48	122	82	215	17:45			297	1231	146	669	443	1900
06:00			30		29		59		18:00			303		168		471	
06:15			45		64		109		18:15			263		130		393	
06:30			88		90		178		18:30			242		135		377	
06:45			97	260	128	311	225	571	18:45			216	1024	130	563	346	1587
07:00			103		158		261		19:00			228		117		345	
07:15			116		202		318		19:15			138		126		264	
07:30			190		223		413		19:30			141		119		260	
07:45			195	604	295	878	490	1482	19:45			108	615	114	476	222	1091
08:00			175		308		483		20:00			122		95		217	
08:15			144		270		414		20:15			117		96		213	
08:30			158		260		418		20:30			104		83		187	
08:45			136	613	148	986	284	1599	20:45			100	443	92	366	192	809
09:00			124		157		281		21:00			101		64		165	
09:15			100		153		253		21:15			78		85		163	
09:30			106		148		254		21:30			72		54		126	
09:45			119	449	128	586	247	1035	21:45			73	324	44	247	117	571
10:00			118		121		239		22:00			52		30		82	
10:15			99		111		210		22:15			34		35		69	
10:30			112		131		243		22:30			40		22		62	
10:45			119	448	119	482	238	930	22:45			27	153	12	99	39	252
11:00			122		114		236		23:00			35		30		65	
11:15			116		132		248		23:15			23		19		42	
11:30			136		126		262		23:30			17		14		31	
11:45			130	504	133	505	263	1009	23:45			16	91	10	73	26	164
TOTALS				3113		4054		**7167**	**TOTALS**				7864		5678		**13542**
SPLIT %				43.4%		56.6%		**34.6%**	**SPLIT %**				58.1%		41.9%		**65.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,977	9,732	20,709

AM Peak Hour			07:30	07:45	**07:45**	**PM Peak Hour**			17:00	15:00	**16:45**
AM Pk Volume			704	1133	**1805**	**PM Pk Volume**			1231	791	**1966**
Pk Hr Factor			0.903	0.920	**0.921**	**Pk Hr Factor**			0.953	0.817	**0.966**
7 - 9 Volume	0	0	1217	1864	**3081**	**4 - 6 Volume**	0	0	2306	1388	**3694**
7 - 9 Peak Hour			07:30	07:45	**07:45**	**4 - 6 Peak Hour**			17:00	16:45	**16:45**
7 - 9 Pk Volume	0	0	704	1133	**1805**	**4 - 6 Pk Volume**	0	0	1231	740	**1966**
Pk Hr Factor	0.000	0.000	0.903	0.920	**0.921**	**Pk Hr Factor**	0.000	0.000	0.953	0.853	**0.966**

Prepared by NDS/ATD

VOLUME

Rockfield Blvd W/O Lake Forest Dr

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_016

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,870	11,041	21,911

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			24		9		33		12:00			268		249		517	
00:15			13		10		23		12:15			255		263		518	
00:30			8		5		13		12:30			252		265		517	
00:45			13	58	2	26	15	84	12:45			245	1020	254	1031	499	2051
01:00			7		4		11		13:00			261		262		523	
01:15			8		3		11		13:15			236		248		484	
01:30			8		4		12		13:30			233		248		481	
01:45			9	32	4	15	13	47	13:45			233	963	220	978	453	1941
02:00			5		1		6		14:00			187		249		436	
02:15			5		2		7		14:15			233		195		428	
02:30			4		0		4		14:30			224		185		409	
02:45			1	15	2	5	3	20	14:45			190	834	190	819	380	1653
03:00			4		1		5		15:00			222		155		377	
03:15			2		4		6		15:15			166		168		334	
03:30			3		4		7		15:30			184		171		355	
03:45			2	11	5	14	7	25	15:45			204	776	171	665	375	1441
04:00			2		3		5		16:00			219		161		380	
04:15			5		4		9		16:15			204		173		377	
04:30			8		18		26		16:30			243		162		405	
04:45			9	24	19	44	28	68	16:45			223	889	156	652	379	1541
05:00			8		17		25		17:00			279		173		452	
05:15			9		25		34		17:15			250		175		425	
05:30			17		43		60		17:30			247		153		400	
05:45			29	63	50	135	79	198	17:45			219	995	199	700	418	1695
06:00			33		72		105		18:00			237		148		385	
06:15			22		66		88		18:15			191		138		329	
06:30			36		105		141		18:30			192		141		333	
06:45			44	135	157	400	201	535	18:45			179	799	139	566	318	1365
07:00			66		161		227		19:00			160		127		287	
07:15			77		172		249		19:15			133		110		243	
07:30			71		167		238		19:30			115		99		214	
07:45			62	276	202	702	264	978	19:45			144	552	95	431	239	983
08:00			85		210		295		20:00			143		97		240	
08:15			92		218		310		20:15			121		83		204	
08:30			126		207		333		20:30			138		65		203	
08:45			104	407	213	848	317	1255	20:45			105	507	53	298	158	805
09:00			103		166		269		21:00			115		57		172	
09:15			110		169		279		21:15			110		40		150	
09:30			129		178		307		21:30			87		28		115	
09:45			141	483	213	726	354	1209	21:45			77	389	44	169	121	558
10:00			125		179		304		22:00			49		40		89	
10:15			179		179		358		22:15			41		35		76	
10:30			181		190		371		22:30			39		25		64	
10:45			143	628	190	738	333	1366	22:45			35	164	12	112	47	276
11:00			163		183		346		23:00			15		27		42	
11:15			183		219		402		23:15			26		15		41	
11:30			217		255		472		23:30			23		9		32	
11:45			212	775	252	909	464	1684	23:45			11	75	7	58	18	133
TOTALS				2907		4562		7469	TOTALS				7963		6479		14442
SPLIT %				38.9%		61.1%		34.1%	SPLIT %				55.1%		44.9%		65.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,870	11,041	21,911

AM Peak Hour			11:45	11:45	11:45	PM Peak Hour			12:00	12:15	12:15
AM Pk Volume			987	1029	2016	PM Pk Volume			1020	1044	2057
Pk Hr Factor			0.921	0.971	0.973	Pk Hr Factor			0.951	0.985	0.983
7 - 9 Volume	0	0	683	1550	2233	4 - 6 Volume	0	0	1884	1352	3236
7 - 9 Peak Hour			08:00	08:00	08:00	4 - 6 Peak Hour			16:45	17:00	17:00
7 - 9 Pk Volume	0	0	407	848	1255	4 - 6 Pk Volume	0	0	999	700	1695
Pk Hr Factor	0.000	0.000	0.808	0.972	0.942	Pk Hr Factor	0.000	0.000	0.895	0.879	0.938

Prepared by NDS/ATD

VOLUME

Rockfield Blvd W/O Ridge Route Dr

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_017

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,497	7,052	17,549

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			19		7		26		12:00			190		132		322	
00:15			20		5		25		12:15			205		134		339	
00:30			11		5		16		12:30			197		138		335	
00:45			10	60	5	22	15	82	12:45			220	812	147	551	367	1363
01:00			9		0		9		13:00			202		140		342	
01:15			7		4		11		13:15			172		146		318	
01:30			9		4		13		13:30			188		167		355	
01:45			5	30	3	11	8	41	13:45			199	761	137	590	336	1351
02:00			12		5		17		14:00			179		137		316	
02:15			3		3		6		14:15			161		110		271	
02:30			7		4		11		14:30			196		125		321	
02:45			3	25	2	14	5	39	14:45			183	719	105	477	288	1196
03:00			3		5		8		15:00			197		91		288	
03:15			7		3		10		15:15			209		112		321	
03:30			4		3		7		15:30			199		92		291	
03:45			2	16	2	13	4	29	15:45			235	840	112	407	347	1247
04:00			6		4		10		16:00			233		113		346	
04:15			5		8		13		16:15			250		87		337	
04:30			10		17		27		16:30			236		109		345	
04:45			9	30	20	49	29	79	16:45			278	997	97	406	375	1403
05:00			9		17		26		17:00			304		111		415	
05:15			9		17		26		17:15			292		100		392	
05:30			15		33		48		17:30			298		114		412	
05:45			23	56	44	111	67	167	17:45			282	1176	99	424	381	1600
06:00			20		47		67		18:00			278		102		380	
06:15			29		66		95		18:15			246		111		357	
06:30			42		84		126		18:30			218		99		317	
06:45			58	149	115	312	173	461	18:45			201	943	100	412	301	1355
07:00			60		103		163		19:00			147		87		234	
07:15			64		133		197		19:15			148		65		213	
07:30			70		119		189		19:30			170		83		253	
07:45			63	257	172	527	235	784	19:45			143	608	74	309	217	917
08:00			85		178		263		20:00			137		62		199	
08:15			91		144		235		20:15			112		52		164	
08:30			82		149		231		20:30			114		52		166	
08:45			82	340	145	616	227	956	20:45			90	453	46	212	136	665
09:00			112		93		205		21:00			85		48		133	
09:15			115		116		231		21:15			89		42		131	
09:30			110		115		225		21:30			67		23		90	
09:45			123	460	121	445	244	905	21:45			64	305	35	148	99	453
10:00			126		117		243		22:00			69		25		94	
10:15			131		104		235		22:15			59		19		78	
10:30			114		113		227		22:30			60		19		79	
10:45			113	484	102	436	215	920	22:45			37	225	12	75	49	300
11:00			139		99		238		23:00			25		12		37	
11:15			152		99		251		23:15			35		8		43	
11:30			180		139		319		23:30			34		8		42	
11:45			161	632	111	448	272	1080	23:45			25	119	9	37	34	156
TOTALS				2539		3004		5543	TOTALS				7958		4048		12006
SPLIT %				45.8%		54.2%		31.6%	SPLIT %				66.3%		33.7%		68.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,497	7,052	17,549

AM Peak Hour			11:45	07:45	11:45	PM Peak Hour			17:00	12:45	17:00
AM Pk Volume			753	643	1268	PM Pk Volume			1176	600	1600
Pk Hr Factor			0.918	0.903	0.935	Pk Hr Factor			0.967	0.898	0.964
7 - 9 Volume	0	0	597	1143	1740	4 - 6 Volume	0	0	2173	830	3003
7 - 9 Peak Hour			08:00	07:45	07:45	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	340	643	964	4 - 6 Pk Volume	0	0	1176	424	1600
Pk Hr Factor	0.000	0.000	0.934	0.903	0.916	Pk Hr Factor	0.000	0.000	0.967	0.930	0.964

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Rockfield Blvd W/O El Toro Rd

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_018

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,639	8,003	18,642

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	9		6		15		12:00	0	0	206		161		367	
00:15	0	0	19		9		28		12:15	0	0	230		161		391	
00:30	0	0	8		11		19		12:30	0	0	210		158		368	
00:45	0	0	6	42	8	34	14	76	12:45	0	0	210	856	173	653	383	1509
01:00	0	0	7		7		14		13:00	0	0	245		159		404	
01:15	0	0	4		8		12		13:15	0	0	213		167		380	
01:30	0	0	5		3		8		13:30	0	0	238		164		402	
01:45	0	0	5	21	4	22	9	43	13:45	0	0	219	915	137	627	356	1542
02:00	0	0	5		5		10		14:00	0	0	188		129		317	
02:15	0	0	4		3		7		14:15	0	0	194		110		304	
02:30	0	0	6		2		8		14:30	0	0	196		126		322	
02:45	0	0	3	18	4	14	7	32	14:45	0	0	191	769	123	488	314	1257
03:00	0	0	2		3		5		15:00	0	0	217		126		343	
03:15	0	0	2		1		3		15:15	0	0	202		113		315	
03:30	0	0	5		4		9		15:30	0	0	210		117		327	
03:45	0	0	7	16	1	9	8	25	15:45	0	0	184	813	140	496	324	1309
04:00	0	0	5		1		6		16:00	0	0	207		179		386	
04:15	0	0	10		3		13		16:15	0	0	224		187		411	
04:30	0	0	13		3		16		16:30	0	0	248		190		438	
04:45	0	0	24	52	7	14	31	66	16:45	0	0	228	907	176	732	404	1639
05:00	0	0	15		7		22		17:00	0	0	270		162		432	
05:15	0	0	14		4		18		17:15	0	0	253		167		420	
05:30	0	0	20		12		32		17:30	0	0	252		201		453	
05:45	0	0	35	84	18	41	53	125	17:45	0	0	260	1035	168	698	428	1733
06:00	0	0	33		24		57		18:00	0	0	224		150		374	
06:15	0	0	51		40		91		18:15	0	0	225		103		328	
06:30	0	0	67		48		115		18:30	0	0	180		122		302	
06:45	0	0	76	227	68	180	144	407	18:45	0	0	182	811	112	487	294	1298
07:00	0	0	88		73		161		19:00	0	0	127		119		246	
07:15	0	0	105		109		214		19:15	0	0	136		87		223	
07:30	0	0	111		102		213		19:30	0	0	141		100		241	
07:45	0	0	118	422	137	421	255	843	19:45	0	0	136	540	78	384	214	924
08:00	0	0	152		172		324		20:00	0	0	117		89		206	
08:15	0	0	141		146		287		20:15	0	0	91		72		163	
08:30	0	0	122		147		269		20:30	0	0	76		54		130	
08:45	0	0	105	520	132	597	237	1117	20:45	0	0	80	364	74	289	154	653
09:00	0	0	160		98		258		21:00	0	0	60		60		120	
09:15	0	0	122		111		233		21:15	0	0	65		56		121	
09:30	0	0	100		105		205		21:30	0	0	42		32		74	
09:45	0	0	147	529	101	415	248	944	21:45	0	0	41	208	42	190	83	398
10:00	0	0	147		104		251		22:00	0	0	42		38		80	
10:15	0	0	138		103		241		22:15	0	0	41		30		71	
10:30	0	0	140		116		256		22:30	0	0	34		30		64	
10:45	0	0	145	570	133	456	278	1026	22:45	0	0	35	152	23	121	58	273
11:00	0	0	157		123		280		23:00	0	0	15		23		38	
11:15	0	0	156		146		302		23:15	0	0	19		20		39	
11:30	0	0	193		160		353		23:30	0	0	24		18		42	
11:45	0	0	193	699	130	559	323	1258	23:45	0	0	11	69	15	76	26	145
TOTALS				3200		2762		**5962**	**TOTALS**				7439		5241		**12680**
SPLIT %				53.7%		46.3%		**32.0%**	**SPLIT %**				58.7%		41.3%		**68.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	10,639	8,003	18,642

AM Peak Hour			11:45	11:30	**11:45**	**PM Peak Hour**			17:00	16:00	**17:00**
AM Pk Volume			839	612	**1449**	**PM Pk Volume**			1035	732	**1733**
Pk Hr Factor			0.912	0.950	**0.926**	**Pk Hr Factor**			0.958	0.963	**0.956**
7 - 9 Volume	0	0	942	1018	**1960**	**4 - 6 Volume**	0	0	1942	1430	**3372**
7 - 9 Peak Hour			07:45	07:45	**07:45**	**4 - 6 Peak Hour**			17:00	16:00	**17:00**
7 - 9 Pk Volume	0	0	533	602	**1135**	**4 - 6 Pk Volume**	0	0	1035	732	**1733**
Pk Hr Factor	0.000	0.000	0.877	0.875	**0.876**	**Pk Hr Factor**	0.000	0.000	0.958	0.963	**0.956**

Prepared by NDS/ATD

VOLUME

Rockfield Blvd W/O Los Alisos Blvd

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_019

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,329	6,378	13,707

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			15		12		27		12:00			118		112		230	
00:15			12		11		23		12:15			123		113		236	
00:30			10		5		15		12:30			129		93		222	
00:45			8	45	4	32	12	77	12:45			140	510	118	436	258	946
01:00			6		6		12		13:00			127		90		217	
01:15			3		2		5		13:15			160		158		318	
01:30			5		4		9		13:30			192		131		323	
01:45			5	19	2	14	7	33	13:45			165	644	107	486	272	1130
02:00			2		2		4		14:00			120		87		207	
02:15			2		3		5		14:15			127		75		202	
02:30			2		2		4		14:30			133		86		219	
02:45			6	12	4	11	10	23	14:45			135	515	115	363	250	878
03:00			4		3		7		15:00			139		84		223	
03:15			3		5		8		15:15			128		92		220	
03:30			7		6		13		15:30			133		73		206	
03:45			4	18	7	21	11	39	15:45			140	540	88	337	228	877
04:00			5		6		11		16:00			115		108		223	
04:15			6		11		17		16:15			171		91		262	
04:30			3		19		22		16:30			143		88		231	
04:45			8	22	29	65	37	87	16:45			151	580	108	395	259	975
05:00			9		33		42		17:00			173		104		277	
05:15			12		32		44		17:15			195		98		293	
05:30			15		46		61		17:30			167		103		270	
05:45			20	56	51	162	71	218	17:45			166	701	91	396	257	1097
06:00			26		57		83		18:00			156		96		252	
06:15			26		67		93		18:15			161		115		276	
06:30			38		86		124		18:30			143		92		235	
06:45			56	146	109	319	165	465	18:45			129	589	97	400	226	989
07:00			50		100		150		19:00			107		82		189	
07:15			56		111		167		19:15			123		79		202	
07:30			86		100		186		19:30			93		71		164	
07:45			109	301	117	428	226	729	19:45			103	426	68	300	171	726
08:00			110		143		253		20:00			112		64		176	
08:15			105		138		243		20:15			74		62		136	
08:30			108		130		238		20:30			87		56		143	
08:45			69	392	101	512	170	904	20:45			79	352	51	233	130	585
09:00			71		85		156		21:00			71		52		123	
09:15			63		84		147		21:15			76		37		113	
09:30			69		98		167		21:30			48		35		83	
09:45			53	256	88	355	141	611	21:45			56	251	36	160	92	411
10:00			64		98		162		22:00			54		31		85	
10:15			86		104		190		22:15			39		24		63	
10:30			80		105		185		22:30			29		21		50	
10:45			91	321	90	397	181	718	22:45			34	156	15	91	49	247
11:00			86		94		180		23:00			21		17		38	
11:15			98		95		193		23:15			18		16		34	
11:30			117		127		244		23:30			16		10		26	
11:45			110	411	98	414	208	825	23:45			11	66	8	51	19	117
TOTALS				1999		2730		**4729**	**TOTALS**				5330		3648		**8978**
SPLIT %				42.3%		57.7%		**34.5%**	**SPLIT %**				59.4%		40.6%		**65.5%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,329	6,378	13,707

AM Peak Hour			11:45	07:45	**07:45**	**PM Peak Hour**			17:00	12:45	**13:00**
AM Pk Volume			480	528	**960**	**PM Pk Volume**			701	497	**1130**
Pk Hr Factor			0.930	0.923	**0.949**	**Pk Hr Factor**			0.899	0.786	**0.875**
7 - 9 Volume	0	0	693	940	**1633**	**4 - 6 Volume**	0	0	1281	791	**2072**
7 - 9 Peak Hour			07:45	07:45	**07:45**	**4 - 6 Peak Hour**			17:00	16:45	**16:45**
7 - 9 Pk Volume	0	0	432	528	**960**	**4 - 6 Pk Volume**	0	0	701	413	**1099**
Pk Hr Factor	0.000	0.000	0.982	0.923	**0.949**	**Pk Hr Factor**	0.000	0.000	0.899	0.956	**0.938**

Prepared by NDS/ATD

VOLUME

Portola Pkwy W/O Alton Pkwy

Day: Wednesday
Date: 4/18/2018

City: Foothill Ranch
Project #: CA18_1076_020

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,063	2,913	5,976

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		7		10		12:00			49		36		85	
00:15			3		7		10		12:15			37		35		72	
00:30			2		6		8		12:30			39		58		97	
00:45			1	9	3	23	4	32	12:45			42	167	40	169	82	336
01:00			1		1		2		13:00			42		48		90	
01:15			0		1		1		13:15			69		46		115	
01:30			0		1		1		13:30			50		41		91	
01:45			0	1	1	4	1	5	13:45			47	208	83	218	130	426
02:00			2		1		3		14:00			41		42		83	
02:15			0		0		0		14:15			40		36		76	
02:30			0		0		0		14:30			40		53		93	
02:45			3	5	0	1	3	6	14:45			45	166	29	160	74	326
03:00			0		2		2		15:00			43		39		82	
03:15			1		0		1		15:15			38		62		100	
03:30			2		1		3		15:30			48		61		109	
03:45			3	6	0	3	3	9	15:45			41	170	47	209	88	379
04:00			1		0		1		16:00			43		44		87	
04:15			4		1		5		16:15			47		74		121	
04:30			11		0		11		16:30			41		62		103	
04:45			11	27	1	2	12	29	16:45			42	173	84	264	126	437
05:00			13		0		13		17:00			58		88		146	
05:15			12		0		12		17:15			44		79		123	
05:30			19		0		19		17:30			46		78		124	
05:45			24	68	6	6	30	74	17:45			51	199	70	315	121	514
06:00			28		6		34		18:00			34		67		101	
06:15			36		5		41		18:15			43		59		102	
06:30			64		8		72		18:30			54		61		115	
06:45			71	199	16	35	87	234	18:45			51	182	70	257	121	439
07:00			60		21		81		19:00			50		64		114	
07:15			85		19		104		19:15			22		56		78	
07:30			112		31		143		19:30			31		64		95	
07:45			107	364	25	96	132	460	19:45			27	130	61	245	88	375
08:00			105		30		135		20:00			31		43		74	
08:15			103		54		157		20:15			26		40		66	
08:30			40		47		87		20:30			26		60		86	
08:45			56	304	38	169	94	473	20:45			20	103	40	183	60	286
09:00			32		23		55		21:00			22		39		61	
09:15			58		24		82		21:15			11		37		48	
09:30			54		27		81		21:30			13		21		34	
09:45			47	191	27	101	74	292	21:45			14	60	19	116	33	176
10:00			29		20		49		22:00			6		15		21	
10:15			29		30		59		22:15			8		25		33	
10:30			47		17		64		22:30			5		11		16	
10:45			36	141	28	95	64	236	22:45			4	23	10	61	14	84
11:00			36		26		62		23:00			6		12		18	
11:15			44		35		79		23:15			4		9		13	
11:30			32		42		74		23:30			3		6		9	
11:45			39	151	42	145	81	296	23:45			3	16	9	36	12	52
TOTALS				1466		680		2146	TOTALS				1597		2233		3830
SPLIT %				68.3%		31.7%		35.9%	SPLIT %				41.7%		58.3%		64.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,063	2,913	5,976

AM Peak Hour			07:30	11:45	07:30	PM Peak Hour			13:00	16:45	16:45
AM Pk Volume			427	171	567	PM Pk Volume			208	329	519
Pk Hr Factor			0.953	0.737	0.903	Pk Hr Factor			0.754	0.935	0.889
7 - 9 Volume	0	0	668	265	933	4 - 6 Volume	0	0	372	579	951
7 - 9 Peak Hour			07:30	08:00	07:30	4 - 6 Peak Hour			17:00	16:45	16:45
7 - 9 Pk Volume	0	0	427	169	567	4 - 6 Pk Volume	0	0	199	329	519
Pk Hr Factor	0.000	0.000	0.953	0.782	0.903	Pk Hr Factor	0.000	0.000	0.858	0.935	0.889

Prepared by NDS/ATD

VOLUME

Portola Pkwy W/O Bake Pkwy

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_021

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,168	8,358	17,526

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		8		15		12:00			128		141		269	
00:15			9		14		23		12:15			166		132		298	
00:30			12		2		14		12:30			155		156		311	
00:45			9	37	5	29	14	66	12:45			196	645	128	557	324	1202
01:00			4		2		6		13:00			140		193		333	
01:15			8		1		9		13:15			142		146		288	
01:30			2		3		5		13:30			160		137		297	
01:45			2	16	5	11	7	27	13:45			142	584	164	640	306	1224
02:00			8		4		12		14:00			173		109		282	
02:15			5		2		7		14:15			160		134		294	
02:30			7		6		13		14:30			165		119		284	
02:45			5	25	4	16	9	41	14:45			183	681	113	475	296	1156
03:00			1		3		4		15:00			177		120		297	
03:15			4		2		6		15:15			141		140		281	
03:30			6		5		11		15:30			184		129		313	
03:45			2	13	9	19	11	32	15:45			156	658	115	504	271	1162
04:00			7		4		11		16:00			156		135		291	
04:15			11		7		18		16:15			185		120		305	
04:30			38		10		48		16:30			163		163		326	
04:45			52	108	15	36	67	144	16:45			191	695	155	573	346	1268
05:00			20		28		48		17:00			187		185		372	
05:15			26		29		55		17:15			230		175		405	
05:30			34		28		62		17:30			196		170		366	
05:45			46	126	45	130	91	256	17:45			197	810	163	693	360	1503
06:00			34		48		82		18:00			188		157		345	
06:15			61		65		126		18:15			183		129		312	
06:30			84		85		169		18:30			168		150		318	
06:45			105	284	111	309	216	593	18:45			157	696	149	585	306	1281
07:00			76		137		213		19:00			165		118		283	
07:15			120		146		266		19:15			136		117		253	
07:30			180		145		325		19:30			112		111		223	
07:45			175	551	159	587	334	1138	19:45			111	524	92	438	203	962
08:00			192		213		405		20:00			100		76		176	
08:15			157		186		343		20:15			108		100		208	
08:30			114		176		290		20:30			110		82		192	
08:45			110	573	138	713	248	1286	20:45			85	403	55	313	140	716
09:00			96		132		228		21:00			96		83		179	
09:15			102		108		210		21:15			76		78		154	
09:30			88		114		202		21:30			54		40		94	
09:45			85	371	91	445	176	816	21:45			52	278	40	241	92	519
10:00			86		87		173		22:00			55		43		98	
10:15			90		87		177		22:15			31		30		61	
10:30			89		92		181		22:30			26		22		48	
10:45			105	370	88	354	193	724	22:45			33	145	17	112	50	257
11:00			124		114		238		23:00			25		16		41	
11:15			118		110		228		23:15			29		14		43	
11:30			123		144		267		23:30			11		15		26	
11:45			137	502	154	522	291	1024	23:45			8	73	11	56	19	129
TOTALS				2976		3171		6147	TOTALS				6192		5187		11379
SPLIT %				48.4%		51.6%		35.1%	SPLIT %				54.4%		45.6%		64.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,168	8,358	17,526

AM Peak Hour			07:30	07:45	07:30	PM Peak Hour			17:15	17:00	17:00
AM Pk Volume			704	734	1407	PM Pk Volume			811	693	1503
Pk Hr Factor			0.917	0.862	0.869	Pk Hr Factor			0.882	0.936	0.928
7 - 9 Volume	0	0	1124	1300	2424	4 - 6 Volume	0	0	1505	1266	2771
7 - 9 Peak Hour			07:30	07:45	07:30	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	704	734	1407	4 - 6 Pk Volume	0	0	810	693	1503
Pk Hr Factor	0.000	0.000	0.917	0.862	0.869	Pk Hr Factor	0.000	0.000	0.880	0.936	0.928

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Portola Pkwy W/O Lake Forest Dr

Day: Thursday
Date: 4/12/2018

City: Lake Forest
Project #: CA18_1076_022

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,381	11,296	23,677

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	13		22		35		12:00	0	0	218		199		417	
00:15	0	0	11		12		23		12:15	0	0	225		197		422	
00:30	0	0	11		15		26		12:30	0	0	257		217		474	
00:45	0	0	12	47	13	62	25	109	12:45	0	0	219	919	241	854	460	1773
01:00	0	0	3		7		10		13:00	0	0	212		254		466	
01:15	0	0	7		10		17		13:15	0	0	200		238		438	
01:30	0	0	10		5		15		13:30	0	0	203		206		409	
01:45	0	0	8	28	6	28	14	56	13:45	0	0	186	801	144	842	330	1643
02:00	0	0	5		8		13		14:00	0	0	179		133		312	
02:15	0	0	3		4		7		14:15	0	0	155		161		316	
02:30	0	0	2		2		4		14:30	0	0	200		196		396	
02:45	0	0	2	12	3	17	5	29	14:45	0	0	225	759	168	658	393	1417
03:00	0	0	6		4		10		15:00	0	0	236		157		393	
03:15	0	0	7		4		11		15:15	0	0	196		177		373	
03:30	0	0	11		6		17		15:30	0	0	208		170		378	
03:45	0	0	23	47	15	29	38	76	15:45	0	0	208	848	162	666	370	1514
04:00	0	0	19		12		31		16:00	0	0	224		184		408	
04:15	0	0	42		10		52		16:15	0	0	245		141		386	
04:30	0	0	111		24		135		16:30	0	0	219		175		394	
04:45	0	0	138	310	28	74	166	384	16:45	0	0	252	940	192	692	444	1632
05:00	0	0	25		49		74		17:00	0	0	254		241		495	
05:15	0	0	36		63		99		17:15	0	0	313		196		509	
05:30	0	0	58		72		130		17:30	0	0	299		222		521	
05:45	0	0	61	180	57	241	118	421	17:45	0	0	292	1158	172	831	464	1989
06:00	0	0	45		57		102		18:00	0	0	282		182		464	
06:15	0	0	80		97		177		18:15	0	0	277		183		460	
06:30	0	0	106		138		244		18:30	0	0	235		174		409	
06:45	0	0	162	393	161	453	323	846	18:45	0	0	209	1003	195	734	404	1737
07:00	0	0	103		186		289		19:00	0	0	228		153		381	
07:15	0	0	144		180		324		19:15	0	0	213		155		368	
07:30	0	0	205		201		406		19:30	0	0	219		151		370	
07:45	0	0	169	621	283	850	452	1471	19:45	0	0	161	821	160	619	321	1440
08:00	0	0	137		262		399		20:00	0	0	155		119		274	
08:15	0	0	141		218		359		20:15	0	0	164		93		257	
08:30	0	0	154		191		345		20:30	0	0	163		94		257	
08:45	0	0	120	552	184	855	304	1407	20:45	0	0	164	646	82	388	246	1034
09:00	0	0	109		146		255		21:00	0	0	139		131		270	
09:15	0	0	125		134		259		21:15	0	0	106		130		236	
09:30	0	0	98		121		219		21:30	0	0	90		87		177	
09:45	0	0	134	466	148	549	282	1015	21:45	0	0	81	416	59	407	140	823
10:00	0	0	85		146		231		22:00	0	0	78		44		122	
10:15	0	0	123		133		256		22:15	0	0	49		34		83	
10:30	0	0	105		140		245		22:30	0	0	54		34		88	
10:45	0	0	115	428	151	570	266	998	22:45	0	0	33	214	26	138	59	352
11:00	0	0	167		152		319		23:00	0	0	49		18		67	
11:15	0	0	153		149		302		23:15	0	0	24		15		39	
11:30	0	0	153		176		329		23:30	0	0	20		33		53	
11:45	0	0	176	649	181	658	357	1307	23:45	0	0	30	123	15	81	45	204
TOTALS				3733		4386		8119	TOTALS				8648		6910		15558
SPLIT %				46.0%		54.0%		34.3%	SPLIT %				55.6%		44.4%		65.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,381	11,296	23,677

AM Peak Hour			11:45	07:30	11:45	PM Peak Hour			17:15	12:30	17:00
AM Pk Volume			876	964	1670	PM Pk Volume			1186	950	1989
Pk Hr Factor			0.852	0.852	0.881	Pk Hr Factor			0.947	0.935	0.954
7 - 9 Volume	0	0	1173	1705	2878	4 - 6 Volume	0	0	2098	1523	3621
7 - 9 Peak Hour			07:15	07:30	07:30	4 - 6 Peak Hour			17:00	16:45	17:00
7 - 9 Pk Volume	0	0	655	964	1616	4 - 6 Pk Volume	0	0	1158	851	1989
Pk Hr Factor	0.000	0.000	0.799	0.852	0.894	Pk Hr Factor	0.000	0.000	0.925	0.883	0.954

Prepared by NDS/ATD

VOLUME

Portola Pkwy W/O Glenn Ranch Rd

Day: Thursday
Date: 4/12/2018

City: Foothill Ranch
Project #: CA18_1076_023

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,363	15,920	32,283

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			26		17		43		12:00			296		230		526	
00:15			17		17		34		12:15			264		247		511	
00:30			17		20		37		12:30			278		282		560	
00:45			22	82	9	63	31	145	12:45			284	1122	311	1070	595	2192
01:00			10		14		24		13:00			236		363		599	
01:15			11		11		22		13:15			238		300		538	
01:30			14		10		24		13:30			237		281		518	
01:45			14	49	9	44	23	93	13:45			245	956	217	1161	462	2117
02:00			7		13		20		14:00			242		205		447	
02:15			4		6		10		14:15			230		232		462	
02:30			3		2		5		14:30			252		271		523	
02:45			3	17	5	26	8	43	14:45			283	1007	236	944	519	1951
03:00			4		3		7		15:00			311		244		555	
03:15			10		6		16		15:15			316		261		577	
03:30			13		10		23		15:30			310		235		545	
03:45			24	51	17	36	41	87	15:45			316	1253	234	974	550	2227
04:00			18		11		29		16:00			338		223		561	
04:15			43		14		57		16:15			342		193		535	
04:30			105		29		134		16:30			356		210		566	
04:45			155	321	54	108	209	429	16:45			400	1436	272	898	672	2334
05:00			26		74		100		17:00			469		260		729	
05:15			32		102		134		17:15			487		264		751	
05:30			60		90		150		17:30			431		244		675	
05:45			83	201	115	381	198	582	17:45			400	1787	242	1010	642	2797
06:00			70		102		172		18:00			380		216		596	
06:15			84		148		232		18:15			362		242		604	
06:30			143		205		348		18:30			319		223		542	
06:45			213	510	271	726	484	1236	18:45			287	1348	270	951	557	2299
07:00			132		293		425		19:00			301		176		477	
07:15			164		302		466		19:15			266		190		456	
07:30			230		339		569		19:30			254		188		442	
07:45			235	761	467	1401	702	2162	19:45			218	1039	217	771	435	1810
08:00			154		472		626		20:00			207		160		367	
08:15			180		391		571		20:15			200		127		327	
08:30			170		311		481		20:30			209		129		338	
08:45			158	662	289	1463	447	2125	20:45			171	787	109	525	280	1312
09:00			135		258		393		21:00			182		165		347	
09:15			161		229		390		21:15			125		168		293	
09:30			146		198		344		21:30			107		112		219	
09:45			158	600	198	883	356	1483	21:45			103	517	80	525	183	1042
10:00			134		202		336		22:00			99		47		146	
10:15			156		193		349		22:15			71		42		113	
10:30			142		200		342		22:30			71		45		116	
10:45			155	587	204	799	359	1386	22:45			41	282	39	173	80	455
11:00			201		205		406		23:00			56		25		81	
11:15			203		203		406		23:15			32		21		53	
11:30			199		230		429		23:30			29		35		64	
11:45			238	841	249	887	487	1728	23:45			30	147	20	101	50	248
TOTALS				4682		6817		11499	TOTALS				11681		9103		20784
SPLIT %				40.7%		59.3%		35.6%	SPLIT %				56.2%		43.8%		64.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	16,363	15,920	32,283

AM Peak Hour			11:45	07:30	07:30	PM Peak Hour			16:45	12:30	16:45
AM Pk Volume			1076	1669	2468	PM Pk Volume			1787	1256	2827
Pk Hr Factor			0.909	0.884	0.879	Pk Hr Factor			0.917	0.865	0.941
7 - 9 Volume	0	0	1423	2864	4287	4 - 6 Volume	0	0	3223	1908	5131
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:45	16:45	16:45
7 - 9 Pk Volume	0	0	799	1669	2468	4 - 6 Pk Volume	0	0	1787	1040	2827
Pk Hr Factor	0.000	0.000	0.850	0.884	0.879	Pk Hr Factor	0.000	0.000	0.917	0.956	0.941

Prepared by NDS/ATD

VOLUME

Portola Pkwy E/O SR-241

Day: Thursday
Date: 4/12/2018

City: Foothill Ranch
Project #: CA18_1076_024

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,626	12,699	25,325

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			16		12		28		12:00			188		173		361	
00:15			11		14		25		12:15			213		212		425	
00:30			9		13		22		12:30			184		234		418	
00:45			13	49	7	46	20	95	12:45			198	783	230	849	428	1632
01:00			9		10		19		13:00			224		199		423	
01:15			8		7		15		13:15			189		210		399	
01:30			6		7		13		13:30			224		166		390	
01:45			10	33	4	28	14	61	13:45			193	830	178	753	371	1583
02:00			7		9		16		14:00			197		152		349	
02:15			5		3		8		14:15			189		184		373	
02:30			2		5		7		14:30			219		192		411	
02:45			3	17	8	25	11	42	14:45			261	866	171	699	432	1565
03:00			4		6		10		15:00			293		195		488	
03:15			3		6		9		15:15			216		267		483	
03:30			4		5		9		15:30			250		192		442	
03:45			3	14	15	32	18	46	15:45			261	1020	207	861	468	1881
04:00			6		4		10		16:00			285		166		451	
04:15			9		11		20		16:15			259		230		489	
04:30			10		24		34		16:30			325		192		517	
04:45			26	51	67	106	93	157	16:45			331	1200	258	846	589	2046
05:00			20		34		54		17:00			377		266		643	
05:15			28		34		62		17:15			362		261		623	
05:30			35		49		84		17:30			343		225		568	
05:45			36	119	81	198	117	317	17:45			285	1367	222	974	507	2341
06:00			40		63		103		18:00			266		215		481	
06:15			70		104		174		18:15			264		234		498	
06:30			133		151		284		18:30			262		221		483	
06:45			191	434	187	505	378	939	18:45			208	1000	197	867	405	1867
07:00			106		216		322		19:00			218		152		370	
07:15			136		202		338		19:15			195		157		352	
07:30			224		252		476		19:30			191		162		353	
07:45			224	690	351	1021	575	1711	19:45			162	766	161	632	323	1398
08:00			152		383		535		20:00			140		151		291	
08:15			156		329		485		20:15			159		128		287	
08:30			133		223		356		20:30			110		123		233	
08:45			142	583	255	1190	397	1773	20:45			112	521	108	510	220	1031
09:00			111		185		296		21:00			141		112		253	
09:15			131		188		319		21:15			97		96		193	
09:30			114		157		271		21:30			71		80		151	
09:45			140	496	168	698	308	1194	21:45			66	375	74	362	140	737
10:00			114		160		274		22:00			60		45		105	
10:15			107		145		252		22:15			38		41		79	
10:30			123		138		261		22:30			41		41		82	
10:45			125	469	152	595	277	1064	22:45			29	168	34	161	63	329
11:00			184		159		343		23:00			36		19		55	
11:15			156		147		303		23:15			18		18		36	
11:30			168		185		353		23:30			17		13		30	
11:45			178	686	185	676	363	1362	23:45			18	89	15	65	33	154
TOTALS				3641		5120		8761	TOTALS				8985		7579		16564
SPLIT %				41.6%		58.4%		34.6%	SPLIT %				54.2%		45.8%		65.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	12,626	12,699	25,325

AM Peak Hour			11:45	07:30	07:30	PM Peak Hour			16:45	16:45	16:45
AM Pk Volume			763	1315	2071	PM Pk Volume			1413	1010	2423
Pk Hr Factor			0.896	0.858	0.900	Pk Hr Factor			0.937	0.949	0.942
7 - 9 Volume	0	0	1273	2211	3484	4 - 6 Volume	0	0	2567	1820	4387
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:45	16:45	16:45
7 - 9 Pk Volume	0	0	756	1315	2071	4 - 6 Pk Volume	0	0	1413	1010	2423
Pk Hr Factor	0.000	0.000	0.844	0.858	0.900	Pk Hr Factor	0.000	0.000	0.937	0.949	0.942

Prepared by NDS/ATD

VOLUME

Portola Pkwy S/O SR-241

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_025

DAILY TOTALS	NB	SB	EB	WB	Total
	13,395	14,082	0	0	27,477

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	21		18						39		12:00	183		199						382	
00:15	15		19						34		12:15	178		218						396	
00:30	12		14						26		12:30	248		184						432	
00:45	19	67	8	59					27	126	12:45	227	836	206	807					433	1643
01:00	7		12						19		13:00	197		205						402	
01:15	7		19						26		13:15	177		183						360	
01:30	15		8						23		13:30	175		207						382	
01:45	8	37	3	42					11	79	13:45	160	709	246	841					406	1550
02:00	10		4						14		14:00	204		241						445	
02:15	11		6						17		14:15	230		203						433	
02:30	10		7						17		14:30	189		242						431	
02:45	10	41	6	23					16	64	14:45	209	832	215	901					424	1733
03:00	9		6						15		15:00	209		254						463	
03:15	8		6						14		15:15	269		231						500	
03:30	12		8						20		15:30	235		274						509	
03:45	22	51	9	29					31	80	15:45	233	946	298	1057					531	2003
04:00	18		10						28		16:00	221		304						525	
04:15	21		12						33		16:15	204		277						481	
04:30	40		17						57		16:30	221		341						562	
04:45	64	143	18	57					82	200	16:45	251	897	278	1200					529	2097
05:00	34		28						62		17:00	264		382						646	
05:15	54		28						82		17:15	251		376						627	
05:30	62		37						99		17:30	247		339						586	
05:45	95	245	49	142					144	387	17:45	227	989	341	1438					568	2427
06:00	85		61						146		18:00	232		330						562	
06:15	104		90						194		18:15	211		295						506	
06:30	139		130						269		18:30	215		307						522	
06:45	244	572	215	496					459	1068	18:45	190	848	268	1200					458	2048
07:00	270		133						403		19:00	165		252						417	
07:15	277		139						416		19:15	152		199						351	
07:30	322		243						565		19:30	163		192						355	
07:45	359	1228	301	816					660	2044	19:45	139	619	136	779					275	1398
08:00	353		193						546		20:00	124		152						276	
08:15	314		196						510		20:15	149		141						290	
08:30	232		223						455		20:30	120		142						262	
08:45	250	1149	199	811					449	1960	20:45	116	509	130	565					246	1074
09:00	204		143						347		21:00	132		117						249	
09:15	186		184						370		21:15	92		103						195	
09:30	143		159						302		21:30	60		109						169	
09:45	185	718	168	654					353	1372	21:45	68	352	72	401					140	753
10:00	157		159						316		22:00	66		64						130	
10:15	148		170						318		22:15	54		61						115	
10:30	164		180						344		22:30	38		46						84	
10:45	163	632	155	664					318	1296	22:45	31	189	48	219					79	408
11:00	171		161						332		23:00	36		55						91	
11:15	142		178						320		23:15	17		24						41	
11:30	193		214						407		23:30	13		28						41	
11:45	190	696	186	739					376	1435	23:45	24	90	35	142					59	232
TOTALS		5579		4532						10111	TOTALS		7816		9550						17366
SPLIT %		55.2%		44.8%						36.8%	SPLIT %		45.0%		55.0%						63.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	13,395	14,082	0	0	27,477

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	16:45	17:00			17:00
AM Pk Volume	1348	933			2281	PM Pk Volume	1013	1438			2427
Pk Hr Factor	0.939	0.775			0.864	Pk Hr Factor	0.959	0.941			0.939
7 - 9 Volume	2377	1627	0	0	4004	4 - 6 Volume	1886	2638	0	0	4524
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	1348	933	0	0	2281	4 - 6 Pk Volume	1013	1438	0	0	2427
Pk Hr Factor	0.939	0.775	0.000	0.000	0.864	Pk Hr Factor	0.959	0.941	0.000	0.000	0.939

Prepared by NDS/ATD

VOLUME

Portola Pkwy W/O El Toro Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_026

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	17,097	18,642	35,739

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			20		30		50		12:00			251		212		463	
00:15			22		17		39		12:15			244		222		466	
00:30			16		15		31		12:30			214		334		548	
00:45			12	70	15	77	27	147	12:45			237	946	279	1047	516	1993
01:00			13		12		25		13:00			263		277		540	
01:15			21		10		31		13:15			191		264		455	
01:30			16		13		29		13:30			242		224		466	
01:45			10	60	12	47	22	107	13:45			265	961	220	985	485	1946
02:00			8		11		19		14:00			293		267		560	
02:15			9		14		23		14:15			205		309		514	
02:30			5		11		16		14:30			291		218		509	
02:45			7	29	11	47	18	76	14:45			251	1040	290	1084	541	2124
03:00			6		12		18		15:00			330		256		586	
03:15			8		12		20		15:15			277		330		607	
03:30			10		21		31		15:30			349		254		603	
03:45			8	32	36	81	44	113	15:45			387	1343	282	1122	669	2465
04:00			7		25		32		16:00			351		259		610	
04:15			9		42		51		16:15			369		273		642	
04:30			13		74		87		16:30			417		256		673	
04:45			14	43	99	240	113	283	16:45			421	1558	337	1125	758	2683
05:00			21		74		95		17:00			522		285		807	
05:15			21		98		119		17:15			601		336		937	
05:30			27		132		159		17:30			467		267		734	
05:45			51	120	155	459	206	579	17:45			454	2044	347	1235	801	3279
06:00			57		162		219		18:00			542		273		815	
06:15			86		196		282		18:15			425		289		714	
06:30			133		238		371		18:30			432		285		717	
06:45			196	472	382	978	578	1450	18:45			361	1760	258	1105	619	2865
07:00			102		400		502		19:00			353		241		594	
07:15			114		434		548		19:15			283		224		507	
07:30			215		478		693		19:30			287		235		522	
07:45			236	667	545	1857	781	2524	19:45			257	1180	200	900	457	2080
08:00			145		575		720		20:00			249		178		427	
08:15			126		525		651		20:15			230		174		404	
08:30			150		435		585		20:30			223		153		376	
08:45			146	567	380	1915	526	2482	20:45			211	913	142	647	353	1560
09:00			122		343		465		21:00			182		156		338	
09:15			150		292		442		21:15			148		114		262	
09:30			135		252		387		21:30			158		86		244	
09:45			169	576	262	1149	431	1725	21:45			121	609	83	439	204	1048
10:00			172		216		388		22:00			117		74		191	
10:15			158		221		379		22:15			107		53		160	
10:30			176		236		412		22:30			77		47		124	
10:45			182	688	208	881	390	1569	22:45			71	372	39	213	110	585
11:00			174		216		390		23:00			91		41		132	
11:15			193		206		399		23:15			49		20		69	
11:30			230		253		483		23:30			38		19		57	
11:45			228	825	228	903	456	1728	23:45			44	222	26	106	70	328
TOTALS				4149		8634		12783	TOTALS				12948		10008		22956
SPLIT %				32.5%		67.5%		35.8%	SPLIT %				56.4%		43.6%		64.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	17,097	18,642	35,739

AM Peak Hour			11:30	07:30	07:30	PM Peak Hour			17:15	17:00	17:15
AM Pk Volume			953	2123	2845	PM Pk Volume			2064	1235	3287
Pk Hr Factor			0.949	0.923	0.911	Pk Hr Factor			0.859	0.890	0.877
7 - 9 Volume	0	0	1234	3772	5006	4 - 6 Volume	0	0	3602	2360	5962
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	722	2123	2845	4 - 6 Pk Volume	0	0	2044	1235	3279
Pk Hr Factor	0.000	0.000	0.765	0.923	0.911	Pk Hr Factor	0.000	0.000	0.850	0.890	0.875

Prepared by NDS/ATD

VOLUME

Portola Pkwy E/O El Toro Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_027

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,148	18,848	37,996

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			17		27		44		12:00			272		254		526	
00:15			29		19		48		12:15			262		228		490	
00:30			17		22		39		12:30			231		363		594	
00:45			16	79	16	84	32	163	12:45			293	1058	219	1064	512	2122
01:00			15		14		29		13:00			299		298		597	
01:15			25		15		40		13:15			243		268		511	
01:30			16		12		28		13:30			295		241		536	
01:45			13	69	16	57	29	126	13:45			297	1134	227	1034	524	2168
02:00			11		11		22		14:00			324		287		611	
02:15			12		10		22		14:15			259		326		585	
02:30			11		9		20		14:30			308		293		601	
02:45			10	44	8	38	18	82	14:45			307	1198	282	1188	589	2386
03:00			9		11		20		15:00			333		339		672	
03:15			12		10		22		15:15			335		341		676	
03:30			16		22		38		15:30			384		302		686	
03:45			12	49	32	75	44	124	15:45			396	1448	295	1277	691	2725
04:00			11		37		48		16:00			400		291		691	
04:15			15		40		55		16:15			382		288		670	
04:30			27		71		98		16:30			393		279		672	
04:45			37	90	97	245	134	335	16:45			432	1607	319	1177	751	2784
05:00			30		68		98		17:00			496		302		798	
05:15			29		84		113		17:15			595		328		923	
05:30			40		99		139		17:30			483		318		801	
05:45			79	178	154	405	233	583	17:45			494	2068	323	1271	817	3339
06:00			68		148		216		18:00			521		274		795	
06:15			114		204		318		18:15			423		292		715	
06:30			157		249		406		18:30			417		247		664	
06:45			305	644	354	955	659	1599	18:45			382	1743	226	1039	608	2782
07:00			144		414		558		19:00			348		217		565	
07:15			204		388		592		19:15			285		236		521	
07:30			291		459		750		19:30			308		216		524	
07:45			379	1018	472	1733	851	2751	19:45			274	1215	192	861	466	2076
08:00			230		544		774		20:00			259		165		424	
08:15			194		494		688		20:15			235		204		439	
08:30			205		392		597		20:30			254		155		409	
08:45			202	831	362	1792	564	2623	20:45			232	980	152	676	384	1656
09:00			185		309		494		21:00			185		155		340	
09:15			170		326		496		21:15			168		138		306	
09:30			171		292		463		21:30			158		110		268	
09:45			201	727	240	1167	441	1894	21:45			139	650	91	494	230	1144
10:00			191		232		423		22:00			129		82		211	
10:15			183		229		412		22:15			109		63		172	
10:30			202		214		416		22:30			85		59		144	
10:45			200	776	227	902	427	1678	22:45			76	399	35	239	111	638
11:00			185		232		417		23:00			89		53		142	
11:15			209		223		432		23:15			57		29		86	
11:30			255		248		503		23:30			45		23		68	
11:45			253	902	241	944	494	1846	23:45			50	241	26	131	76	372
TOTALS				5407		8397		13804	TOTALS				13741		10451		24192
SPLIT %				39.2%		60.8%		36.3%	SPLIT %				56.8%		43.2%		63.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	19,148	18,848	37,996

AM Peak Hour			07:15	07:30	07:30	PM Peak Hour			17:15	15:00	17:00
AM Pk Volume			1104	1969	3063	PM Pk Volume			2093	1277	3339
Pk Hr Factor			0.728	0.905	0.900	Pk Hr Factor			0.879	0.936	0.904
7 - 9 Volume	0	0	1849	3525	5374	4 - 6 Volume	0	0	3675	2448	6123
7 - 9 Peak Hour			07:15	07:30	07:30	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	1104	1969	3063	4 - 6 Pk Volume	0	0	2068	1271	3339
Pk Hr Factor	0.000	0.000	0.728	0.905	0.900	Pk Hr Factor	0.000	0.000	0.869	0.969	0.904

Prepared by NDS/ATD

VOLUME

Rancho Pkwy S W/O Bake Pkwy

Day: Tuesday
Date: 4/10/2018

City: Lake Forest
Project #: CA18_1076_028

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,642	3,758	7,400

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			9		5		14		12:00			78		79		157	
00:15			4		1		5		12:15			60		55		115	
00:30			11		10		21		12:30			53		78		131	
00:45			2	26	6	22	8	48	12:45			54	245	82	294	136	539
01:00			1		1		2		13:00			61		82		143	
01:15			0		1		1		13:15			65		70		135	
01:30			2		8		10		13:30			71		60		131	
01:45			0	3	0	10	0	13	13:45			64	261	56	268	120	529
02:00			2		1		3		14:00			68		67		135	
02:15			1		2		3		14:15			60		45		105	
02:30			1		0		1		14:30			59		50		109	
02:45			0	4	1	4	1	8	14:45			48	235	54	216	102	451
03:00			0		0		0		15:00			63		56		119	
03:15			3		4		7		15:15			61		47		108	
03:30			1		1		2		15:30			78		52		130	
03:45			2	6	5	10	7	16	15:45			65	267	71	226	136	493
04:00			2		1		3		16:00			96		56		152	
04:15			2		3		5		16:15			58		58		116	
04:30			2		6		8		16:30			72		70		142	
04:45			8	14	12	22	20	36	16:45			66	292	74	258	140	550
05:00			5		8		13		17:00			115		95		210	
05:15			15		13		28		17:15			85		67		152	
05:30			11		11		22		17:30			86		72		158	
05:45			24	55	30	62	54	117	17:45			77	363	45	279	122	642
06:00			19		20		39		18:00			80		54		134	
06:15			20		30		50		18:15			72		59		131	
06:30			45		44		89		18:30			48		54		102	
06:45			41	125	60	154	101	279	18:45			53	253	47	214	100	467
07:00			50		53		103		19:00			41		45		86	
07:15			46		65		111		19:15			43		29		72	
07:30			65		72		137		19:30			37		40		77	
07:45			74	235	104	294	178	529	19:45			24	145	42	156	66	301
08:00			72		90		162		20:00			38		42		80	
08:15			59		110		169		20:15			40		30		70	
08:30			57		98		155		20:30			33		23		56	
08:45			60	248	81	379	141	627	20:45			22	133	20	115	42	248
09:00			52		69		121		21:00			29		32		61	
09:15			61		64		125		21:15			21		20		41	
09:30			50		54		104		21:30			16		24		40	
09:45			45	208	56	243	101	451	21:45			13	79	21	97	34	176
10:00			31		41		72		22:00			12		18		30	
10:15			26		38		64		22:15			14		19		33	
10:30			30		26		56		22:30			10		14		24	
10:45			40	127	53	158	93	285	22:45			7	43	10	61	17	104
11:00			48		38		86		23:00			19		19		38	
11:15			60		48		108		23:15			7		9		16	
11:30			50		44		94		23:30			8		2		10	
11:45			79	237	53	183	132	420	23:45			4	38	3	33	7	71
TOTALS				1288		1541		2829	TOTALS				2354		2217		4571
SPLIT %				45.5%		54.5%		38.2%	SPLIT %				51.5%		48.5%		61.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,642	3,758	7,400

AM Peak Hour			07:30	07:45	07:45	PM Peak Hour			17:00	12:30	16:45
AM Pk Volume			270	402	664	PM Pk Volume			363	312	660
Pk Hr Factor			0.912	0.914	0.933	Pk Hr Factor			0.789	0.951	0.786
7 - 9 Volume	0	0	483	673	1156	4 - 6 Volume	0	0	655	537	1192
7 - 9 Peak Hour			07:30	07:45	07:45	4 - 6 Peak Hour			17:00	16:45	16:45
7 - 9 Pk Volume	0	0	270	402	664	4 - 6 Pk Volume	0	0	363	308	660
Pk Hr Factor	0.000	0.000	0.912	0.914	0.933	Pk Hr Factor	0.000	0.000	0.789	0.811	0.786

Prepared by NDS/ATD

VOLUME

Rancho Pkwy E/O Bake Pkwy

Day: Tuesday
Date: 4/10/2018

City: Lake Forest
Project #: CA18_1076_029

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,764	7,150	13,914

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			8		10		18		12:00			139		134		273	
00:15			9		8		17		12:15			106		141		247	
00:30			5		6		11		12:30			131		139		270	
00:45			8	30	2	26	10	56	12:45			101	477	166	580	267	1057
01:00			5		4		9		13:00			123		144		267	
01:15			4		7		11		13:15			113		117		230	
01:30			5		4		9		13:30			116		141		257	
01:45			3	17	8	23	11	40	13:45			96	448	109	511	205	959
02:00			2		1		3		14:00			115		108		223	
02:15			1		6		7		14:15			112		131		243	
02:30			4		5		9		14:30			96		124		220	
02:45			3	10	2	14	5	24	14:45			109	432	98	461	207	893
03:00			2		2		4		15:00			98		98		196	
03:15			1		4		5		15:15			108		110		218	
03:30			7		6		13		15:30			113		117		230	
03:45			8	18	8	20	16	38	15:45			156	475	131	456	287	931
04:00			3		8		11		16:00			136		101		237	
04:15			9		10		19		16:15			149		90		239	
04:30			7		13		20		16:30			164		118		282	
04:45			14	33	21	52	35	85	16:45			148	597	100	409	248	1006
05:00			17		17		34		17:00			215		133		348	
05:15			18		22		40		17:15			174		99		273	
05:30			33		31		64		17:30			180		121		301	
05:45			20	88	51	121	71	209	17:45			185	754	104	457	289	1211
06:00			32		38		70		18:00			164		126		290	
06:15			32		78		110		18:15			146		100		246	
06:30			56		78		134		18:30			153		91		244	
06:45			59	179	111	305	170	484	18:45			153	616	82	399	235	1015
07:00			61		110		171		19:00			117		88		205	
07:15			53		122		175		19:15			119		80		199	
07:30			74		135		209		19:30			88		104		192	
07:45			79	267	154	521	233	788	19:45			106	430	71	343	177	773
08:00			65		182		247		20:00			103		83		186	
08:15			58		160		218		20:15			91		58		149	
08:30			62		131		193		20:30			90		47		137	
08:45			73	258	166	639	239	897	20:45			61	345	44	232	105	577
09:00			68		123		191		21:00			52		48		100	
09:15			81		114		195		21:15			54		35		89	
09:30			71		94		165		21:30			38		32		70	
09:45			64	284	109	440	173	724	21:45			36	180	22	137	58	317
10:00			64		89		153		22:00			34		37		71	
10:15			60		104		164		22:15			26		40		66	
10:30			64		91		155		22:30			30		20		50	
10:45			61	249	107	391	168	640	22:45			13	103	10	107	23	210
11:00			89		103		192		23:00			31		17		48	
11:15			92		98		190		23:15			24		16		40	
11:30			94		131		225		23:30			21		17		38	
11:45			112	387	116	448	228	835	23:45			11	87	8	58	19	145
TOTALS				1820		3000		**4820**	**TOTALS**				4944		4150		**9094**
SPLIT %				37.8%		62.2%		**34.6%**	**SPLIT %**				54.4%		45.6%		**65.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,764	7,150	13,914

AM Peak Hour			11:45	08:00	**11:45**	**PM Peak Hour**			17:00	12:15	**17:00**
AM Pk Volume			488	639	**1018**	**PM Pk Volume**			754	590	**1211**
Pk Hr Factor			0.878	0.878	**0.932**	**Pk Hr Factor**			0.877	0.889	**0.870**
7 - 9 Volume	0	0	525	1160	**1685**	**4 - 6 Volume**	0	0	1351	866	**2217**
7 - 9 Peak Hour			07:30	08:00	**07:30**	**4 - 6 Peak Hour**			17:00	17:00	**17:00**
7 - 9 Pk Volume	0	0	276	639	**907**	**4 - 6 Pk Volume**	0	0	754	457	**1211**
Pk Hr Factor	0.000	0.000	0.873	0.878	**0.918**	**Pk Hr Factor**	0.000	0.000	0.877	0.859	**0.870**

Prepared by NDS/ATD

VOLUME

Rancho Pkwy E/O Lake Forest Dr

Day: Tuesday
Date: 4/10/2018

City: Lake Forest
Project #: CA18_1076_030

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,662	9,778	19,440

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			11		10		21		12:00			168		181		349	
00:15			9		7		16		12:15			154		166		320	
00:30			2		4		6		12:30			155		166		321	
00:45			9	31	5	26	14	57	12:45			170	647	146	659	316	1306
01:00			3		7		10		13:00			152		190		342	
01:15			2		10		12		13:15			170		143		313	
01:30			5		4		9		13:30			179		147		326	
01:45			6	16	8	29	14	45	13:45			166	667	113	593	279	1260
02:00			3		5		8		14:00			147		127		274	
02:15			2		4		6		14:15			179		175		354	
02:30			5		4		9		14:30			152		168		320	
02:45			7	17	4	17	11	34	14:45			179	657	129	599	308	1256
03:00			5		4		9		15:00			191		128		319	
03:15			6		10		16		15:15			148		156		304	
03:30			12		6		18		15:30			187		189		376	
03:45			12	35	18	38	30	73	15:45			223	749	140	613	363	1362
04:00			5		15		20		16:00			228		139		367	
04:15			9		20		29		16:15			253		146		399	
04:30			9		14		23		16:30			259		165		424	
04:45			21	44	29	78	50	122	16:45			264	1004	139	589	403	1593
05:00			15		26		41		17:00			284		203		487	
05:15			36		37		73		17:15			289		168		457	
05:30			44		39		83		17:30			302		142		444	
05:45			38	133	66	168	104	301	17:45			320	1195	140	653	460	1848
06:00			34		57		91		18:00			232		165		397	
06:15			57		105		162		18:15			223		147		370	
06:30			84		116		200		18:30			200		152		352	
06:45			112	287	168	446	280	733	18:45			180	835	127	591	307	1426
07:00			85		177		262		19:00			181		129		310	
07:15			75		208		283		19:15			134		90		224	
07:30			97		203		300		19:30			114		95		209	
07:45			117	374	234	822	351	1196	19:45			141	570	99	413	240	983
08:00			88		285		373		20:00			139		110		249	
08:15			72		254		326		20:15			96		73		169	
08:30			96		223		319		20:30			116		79		195	
08:45			105	361	240	1002	345	1363	20:45			70	421	66	328	136	749
09:00			86		217		303		21:00			75		75		150	
09:15			105		169		274		21:15			59		51		110	
09:30			83		117		200		21:30			72		45		117	
09:45			70	344	160	663	230	1007	21:45			41	247	36	207	77	454
10:00			101		116		217		22:00			39		51		90	
10:15			87		123		210		22:15			38		46		84	
10:30			95		108		203		22:30			23		23		46	
10:45			73	356	136	483	209	839	22:45			22	122	13	133	35	255
11:00			114		133		247		23:00			28		19		47	
11:15			89		133		222		23:15			24		12		36	
11:30			111		163		274		23:30			21		24		45	
11:45			149	463	137	566	286	1029	23:45			14	87	7	62	21	149
TOTALS				2461		4338		6799	TOTALS				7201		5440		12641
SPLIT %				36.2%		63.8%		35.0%	SPLIT %				57.0%		43.0%		65.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	9,662	9,778	19,440

AM Peak Hour			11:45	08:00	07:45	PM Peak Hour			17:00	16:30	17:00
AM Pk Volume			626	1002	1369	PM Pk Volume			1195	675	1848
Pk Hr Factor			0.932	0.879	0.918	Pk Hr Factor			0.934	0.831	0.949
7 - 9 Volume	0	0	735	1824	2559	4 - 6 Volume	0	0	2199	1242	3441
7 - 9 Peak Hour			07:15	08:00	07:45	4 - 6 Peak Hour			17:00	16:30	17:00
7 - 9 Pk Volume	0	0	377	1002	1369	4 - 6 Pk Volume	0	0	1195	675	1848
Pk Hr Factor	0.000	0.000	0.806	0.879	0.918	Pk Hr Factor	0.000	0.000	0.934	0.831	0.949

Prepared by NDS/ATD

VOLUME

Glenn Ranch Rd Bet. Portola Pkwy & Saddleback Ranch Rd

Day: Thursday
Date: 4/12/2018

City: Foothill Ranch
Project #: CA18_1076_031

DAILY TOTALS	NB	SB	EB	WB	Total
	8,386	7,690	0	0	16,076

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	15		6						21		12:00	149		109						258	
00:15	7		5						12		12:15	135		89						224	
00:30	18		6						24		12:30	151		132						283	
00:45	14	54	6	23					20	77	12:45	126	561	132	462					258	1023
01:00	3		5						8		13:00	99		189						288	
01:15	5		7						12		13:15	108		141						249	
01:30	9		7						16		13:30	97		112						209	
01:45	7	24	6	25					13	49	13:45	112	416	96	538					208	954
02:00	15		3						18		14:00	115		84						199	
02:15	4		4						8		14:15	86		98						184	
02:30	2		4						6		14:30	116		100						216	
02:45	2	23	3	14					5	37	14:45	119	436	100	382					219	818
03:00	3		9						12		15:00	115		90						205	
03:15	6		8						14		15:15	143		76						219	
03:30	4		5						9		15:30	156		102						258	
03:45	17	30	11	33					28	63	15:45	151	565	93	361					244	926
04:00	21		10						31		16:00	195		109						304	
04:15	23		13						36		16:15	185		80						265	
04:30	69		22						91		16:30	185		101						286	
04:45	99	212	36	81					135	293	16:45	177	742	94	384					271	1126
05:00	72		50						122		17:00	257		94						351	
05:15	65		77						142		17:15	247		91						338	
05:30	70		73						143		17:30	258		104						362	
05:45	52	259	85	285					137	544	17:45	188	950	106	395					294	1345
06:00	45		83						128		18:00	222		76						298	
06:15	57		110						167		18:15	215		84						299	
06:30	60		167						227		18:30	190		84						274	
06:45	95	257	187	547					282	804	18:45	154	781	91	335					245	1116
07:00	91		178						269		19:00	151		72						223	
07:15	59		228						287		19:15	138		78						216	
07:30	74		244						318		19:30	133		66						199	
07:45	73	297	288	938					361	1235	19:45	114	536	49	265					163	801
08:00	80		277						357		20:00	124		58						182	
08:15	77		216						293		20:15	114		38						152	
08:30	62		190						252		20:30	137		37						174	
08:45	77	296	181	864					258	1160	20:45	93	468	37	170					130	638
09:00	63		152						215		21:00	98		88						186	
09:15	79		141						220		21:15	76		49						125	
09:30	67		113						180		21:30	75		34						109	
09:45	68	277	114	520					182	797	21:45	66	315	21	192					87	507
10:00	74		94						168		22:00	49		13						62	
10:15	73		109						182		22:15	45		14						59	
10:30	71		98						169		22:30	37		12						49	
10:45	74	292	110	411					184	703	22:45	32	163	9	48					41	211
11:00	85		83						168		23:00	33		9						42	
11:15	86		100						186		23:15	23		7						30	
11:30	71		88						159		23:30	21		16						37	
11:45	96	338	106	377					202	715	23:45	17	94	8	40					25	134
TOTALS		2359		4118						6477	TOTALS		6027		3572						9599
SPLIT %		36.4%		63.6%						40.3%	SPLIT %		62.8%		37.2%						59.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	8,386	7,690	0	0	16,076

AM Peak Hour	11:45	07:15			07:30	PM Peak Hour	17:00	12:30			17:00
AM Pk Volume	531	1037			1329	PM Pk Volume	950	594			1345
Pk Hr Factor	0.879	0.900			0.920	Pk Hr Factor	0.921	0.786			0.929
7 - 9 Volume	593	1802	0	0	2395	4 - 6 Volume	1692	779	0	0	2471
7 - 9 Peak Hour	07:30	07:15			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	304	1037	0	0	1329	4 - 6 Pk Volume	950	395	0	0	1345
Pk Hr Factor	0.950	0.900	0.000	0.000	0.920	Pk Hr Factor	0.921	0.932	0.000	0.000	0.929

Prepared by NDS/ATD

VOLUME

Glenn Ranch Rd Bet. El Toro Rd & Saddleback Ranch Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_032

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,388	3,461	6,849

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			6		1		7		12:00			39		63		102	
00:15			2		0		2		12:15			28		71		99	
00:30			1		2		3		12:30			44		68		112	
00:45			0	9	3	6	3	15	12:45			35	146	44	246	79	392
01:00			2		1		3		13:00			42		66		108	
01:15			1		1		2		13:15			61		36		97	
01:30			2		0		2		13:30			38		47		85	
01:45			0	5	1	3	1	8	13:45			43	184	47	196	90	380
02:00			1		0		1		14:00			37		43		80	
02:15			4		1		5		14:15			70		53		123	
02:30			1		1		2		14:30			73		42		115	
02:45			2	8	2	4	4	12	14:45			77	257	53	191	130	448
03:00			2		0		2		15:00			60		45		105	
03:15			0		3		3		15:15			80		84		164	
03:30			2		3		5		15:30			83		53		136	
03:45			2	6	5	11	7	17	15:45			61	284	54	236	115	520
04:00			1		2		3		16:00			101		54		155	
04:15			2		6		8		16:15			90		38		128	
04:30			1		7		8		16:30			88		48		136	
04:45			3	7	14	29	17	36	16:45			82	361	46	186	128	547
05:00			3		10		13		17:00			109		46		155	
05:15			7		14		21		17:15			106		69		175	
05:30			10		14		24		17:30			119		52		171	
05:45			9	29	21	59	30	88	17:45			84	418	57	224	141	642
06:00			12		25		37		18:00			98		46		144	
06:15			11		39		50		18:15			69		52		121	
06:30			35		59		94		18:30			64		42		106	
06:45			46	104	76	199	122	303	18:45			57	288	46	186	103	474
07:00			37		85		122		19:00			53		42		95	
07:15			55		92		147		19:15			44		43		87	
07:30			63		103		166		19:30			49		40		89	
07:45			82	237	161	441	243	678	19:45			38	184	35	160	73	344
08:00			61		101		162		20:00			38		18		56	
08:15			45		85		130		20:15			24		27		51	
08:30			51		68		119		20:30			41		22		63	
08:45			34	191	56	310	90	501	20:45			24	127	25	92	49	219
09:00			34		34		68		21:00			24		26		50	
09:15			38		48		86		21:15			15		18		33	
09:30			29		42		71		21:30			23		14		37	
09:45			38	139	43	167	81	306	21:45			19	81	14	72	33	153
10:00			28		44		72		22:00			15		21		36	
10:15			34		49		83		22:15			15		13		28	
10:30			27		54		81		22:30			10		10		20	
10:45			24	113	40	187	64	300	22:45			9	49	8	52	17	101
11:00			46		31		77		23:00			6		5		11	
11:15			41		43		84		23:15			5		5		10	
11:30			32		37		69		23:30			3		3		6	
11:45			26	145	74	185	100	330	23:45			2	16	6	19	8	35
TOTALS				993		1601		2594	TOTALS				2395		1860		4255
SPLIT %				38.3%		61.7%		37.9%	SPLIT %				56.3%		43.7%		62.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,388	3,461	6,849

AM Peak Hour			07:15	07:15	07:15	PM Peak Hour			17:00	12:15	17:00
AM Pk Volume			261	457	718	PM Pk Volume			418	249	642
Pk Hr Factor			0.796	0.710	0.739	Pk Hr Factor			0.878	0.877	0.917
7 - 9 Volume	0	0	428	751	1179	4 - 6 Volume	0	0	779	410	1189
7 - 9 Peak Hour			07:15	07:15	07:15	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	261	457	718	4 - 6 Pk Volume	0	0	418	224	642
Pk Hr Factor	0.000	0.000	0.796	0.710	0.739	Pk Hr Factor	0.000	0.000	0.878	0.812	0.917

Prepared by NDS/ATD

VOLUME

Alton Pkwy S/O Portola Pkwy

Day: Thursday
Date: 4/12/2018

City: Lake Forest
Project #: CA18_1076_033

DAILY TOTALS	NB	SB	EB	WB	Total
	6,618	6,613	0	0	13,231

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	16		11						27		12:00	131		93						224	
00:15	7		7						14		12:15	147		105						252	
00:30	10		3						13		12:30	131		89						220	
00:45	10	43	7	28					17	71	12:45	94	503	107	394					201	897
01:00	12		2						14		13:00	102		116						218	
01:15	4		4						8		13:15	87		131						218	
01:30	4		4						8		13:30	82		99						181	
01:45	2	22	2	12					4	34	13:45	83	354	101	447					184	801
02:00	7		2						9		14:00	89		81						170	
02:15	6		1						7		14:15	99		86						185	
02:30	3		3						6		14:30	109		121						230	
02:45	5	21	4	10					9	31	14:45	121	418	118	406					239	824
03:00	4		5						9		15:00	82		112						194	
03:15	3		6						9		15:15	121		74						195	
03:30	6		7						13		15:30	127		105						232	
03:45	9	22	10	28					19	50	15:45	115	445	89	380					204	825
04:00	7		12						19		16:00	113		78						191	
04:15	11		7						18		16:15	129		86						215	
04:30	46		12						58		16:30	136		86						222	
04:45	41	105	16	47					57	152	16:45	156	534	90	340					246	874
05:00	22		34						56		17:00	154		117						271	
05:15	13		33						46		17:15	152		110						262	
05:30	25		47						72		17:30	192		94						286	
05:45	31	91	45	159					76	250	17:45	174	672	107	428					281	1100
06:00	21		55						76		18:00	136		81						217	
06:15	21		75						96		18:15	151		78						229	
06:30	31		118						149		18:30	171		76						247	
06:45	55	128	121	369					176	497	18:45	120	578	76	311					196	889
07:00	34		150						184		19:00	120		74						194	
07:15	59		198						257		19:15	108		65						173	
07:30	76		210						286		19:30	108		65						173	
07:45	117	286	217	775					334	1061	19:45	83	419	47	251					130	670
08:00	97		201						298		20:00	84		51						135	
08:15	98		209						307		20:15	102		48						150	
08:30	78		157						235		20:30	80		38						118	
08:45	77	350	126	693					203	1043	20:45	65	331	37	174					102	505
09:00	64		106						170		21:00	55		44						99	
09:15	66		112						178		21:15	64		65						129	
09:30	75		88						163		21:30	57		38						95	
09:45	51	256	107	413					158	669	21:45	51	227	28	175					79	402
10:00	58		90						148		22:00	50		23						73	
10:15	47		79						126		22:15	47		20						67	
10:30	50		75						125		22:30	30		21						51	
10:45	67	222	82	326					149	548	22:45	33	160	8	72					41	232
11:00	96		74						170		23:00	31		15						46	
11:15	82		91						173		23:15	15		12						27	
11:30	85		94						179		23:30	11		9						20	
11:45	96	359	72	331					168	690	23:45	15	72	8	44					23	116
TOTALS		1905		3191						5096	TOTALS		4713		3422						8135
SPLIT %		37.4%		62.6%						38.5%	SPLIT %		57.9%		42.1%						61.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	6,618	6,613	0	0	13,231

AM Peak Hour	11:45	07:30			07:30	PM Peak Hour	17:00	12:45			17:00
AM Pk Volume	505	837			1225	PM Pk Volume	672	453			1100
Pk Hr Factor	0.859	0.964			0.917	Pk Hr Factor	0.875	0.865			0.962
7 - 9 Volume	636	1468	0	0	2104	4 - 6 Volume	1206	768	0	0	1974
7 - 9 Peak Hour	07:45	07:30			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	390	837	0	0	1225	4 - 6 Pk Volume	672	428	0	0	1100
Pk Hr Factor	0.833	0.964	0.000	0.000	0.917	Pk Hr Factor	0.875	0.915	0.000	0.000	0.962

Prepared by NDS/ATD

VOLUME

Alton Pkwy S/O SR-241

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_034

DAILY TOTALS	NB	SB	EB	WB	Total
	10,445	8,677	0	0	19,122

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	8		7						15		12:00	197		126						323	
00:15	7		4						11		12:15	179		150						329	
00:30	9		8						17		12:30	192		134						326	
00:45	8	32	9	28					17	60	12:45	179	747	148	558					327	1305
01:00	9		10						19		13:00	150		161						311	
01:15	0		9						9		13:15	141		148						289	
01:30	7		8						15		13:30	171		141						312	
01:45	10	26	8	35					18	61	13:45	162	624	107	557					269	1181
02:00	4		6						10		14:00	148		112						260	
02:15	0		6						6		14:15	166		124						290	
02:30	0		7						7		14:30	159		127						286	
02:45	2	6	3	22					5	28	14:45	159	632	106	469					265	1101
03:00	4		4						8		15:00	166		102						268	
03:15	1		9						10		15:15	185		114						299	
03:30	7		8						15		15:30	193		105						298	
03:45	8	20	14	35					22	55	15:45	241	785	112	433					353	1218
04:00	14		11						25		16:00	257		118						375	
04:15	18		17						35		16:15	243		95						338	
04:30	51		20						71		16:30	260		97						357	
04:45	40	123	42	90					82	213	16:45	256	1016	102	412					358	1428
05:00	19		44						63		17:00	322		118						440	
05:15	34		43						77		17:15	373		117						490	
05:30	34		68						102		17:30	319		120						439	
05:45	36	123	90	245					126	368	17:45	279	1293	130	485					409	1778
06:00	56		89						145		18:00	242		112						354	
06:15	54		135						189		18:15	241		94						335	
06:30	65		154						219		18:30	186		87						273	
06:45	98	273	185	563					283	836	18:45	147	816	76	369					223	1185
07:00	118		188						306		19:00	164		90						254	
07:15	128		221						349		19:15	139		86						225	
07:30	133		258						391		19:30	118		87						205	
07:45	169	548	282	949					451	1497	19:45	120	541	59	322					179	863
08:00	145		306						451		20:00	104		55						159	
08:15	144		295						439		20:15	90		50						140	
08:30	150		281						431		20:30	99		49						148	
08:45	134	573	224	1106					358	1679	20:45	90	383	52	206					142	589
09:00	104		194						298		21:00	75		54						129	
09:15	97		171						268		21:15	57		60						117	
09:30	111		150						261		21:30	42		38						80	
09:45	94	406	146	661					240	1067	21:45	47	221	48	200					95	421
10:00	96		92						188		22:00	40		27						67	
10:15	117		109						226		22:15	35		30						65	
10:30	106		104						210		22:30	41		15						56	
10:45	101	420	91	396					192	816	22:45	19	135	12	84					31	219
11:00	123		110						233		23:00	18		11						29	
11:15	130		83						213		23:15	22		11						33	
11:30	165		86						251		23:30	15		14						29	
11:45	213	631	127	406					340	1037	23:45	16	71	10	46					26	117
TOTALS		3181		4536						7717	TOTALS		7264		4141						11405
SPLIT %		41.2%		58.8%						40.4%	SPLIT %		63.7%		36.3%						59.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	10,445	8,677	0	0	19,122

AM Peak Hour	11:45	07:45			07:45	PM Peak Hour	17:00	12:45			17:00
AM Pk Volume	781	1164			1772	PM Pk Volume	1293	598			1778
Pk Hr Factor	0.917	0.951			0.982	Pk Hr Factor	0.867	0.929			0.907
7 - 9 Volume	1121	2055	0	0	3176	4 - 6 Volume	2309	897	0	0	3206
7 - 9 Peak Hour	07:45	07:45			07:45	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	608	1164	0	0	1772	4 - 6 Pk Volume	1293	485	0	0	1778
Pk Hr Factor	0.899	0.951	0.000	0.000	0.982	Pk Hr Factor	0.867	0.933	0.000	0.000	0.907

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Alton Pkwy S/O Rancho Pkwy

Day: Tuesday
Date: 4/10/2018

City: Lake Forest
Project #: CA18_1076_035

DAILY TOTALS	NB	SB	EB	WB	Total
	11,738	11,523	0	0	23,261

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	16		10		0	0	26		12:00	201		144		0	0	345	
00:15	16		9		0	0	25		12:15	194		138		0	0	332	
00:30	12		5		0	0	17		12:30	194		185		0	0	379	
00:45	8	52	5	29	0	0	13	81	12:45	171	760	185	652	0	0	356	1412
01:00	14		6		0	0	20		13:00	161		179		0	0	340	
01:15	8		5		0	0	13		13:15	142		179		0	0	321	
01:30	9		5		0	0	14		13:30	164		150		0	0	314	
01:45	5	36	4	20	0	0	9	56	13:45	165	632	183	691	0	0	348	1323
02:00	7		4		0	0	11		14:00	147		146		0	0	293	
02:15	8		5		0	0	13		14:15	181		145		0	0	326	
02:30	7		3		0	0	10		14:30	198		159		0	0	357	
02:45	4	26	4	16	0	0	8	42	14:45	155	681	140	590	0	0	295	1271
03:00	6		4		0	0	10		15:00	182		139		0	0	321	
03:15	5		7		0	0	12		15:15	210		132		0	0	342	
03:30	11		13		0	0	24		15:30	215		197		0	0	412	
03:45	15	37	14	38	0	0	29	75	15:45	222	829	148	616	0	0	370	1445
04:00	13		12		0	0	25		16:00	279		163		0	0	442	
04:15	27		25		0	0	52		16:15	242		146		0	0	388	
04:30	65		33		0	0	98		16:30	288		172		0	0	460	
04:45	70	175	40	110	0	0	110	285	16:45	286	1095	166	647	0	0	452	1742
05:00	34		57		0	0	91		17:00	327		207		0	0	534	
05:15	54		50		0	0	104		17:15	416		195		0	0	611	
05:30	45		85		0	0	130		17:30	344		170		0	0	514	
05:45	56	189	96	288	0	0	152	477	17:45	297	1384	157	729	0	0	454	2113
06:00	63		133		0	0	196		18:00	291		167		0	0	458	
06:15	71		150		0	0	221		18:15	279		150		0	0	429	
06:30	105		200		0	0	305		18:30	191		133		0	0	324	
06:45	114	353	267	750	0	0	381	1103	18:45	214	975	137	587	0	0	351	1562
07:00	109		275		0	0	384		19:00	182		128		0	0	310	
07:15	124		333		0	0	457		19:15	161		104		0	0	265	
07:30	157		350		0	0	507		19:30	151		108		0	0	259	
07:45	190	580	410	1368	0	0	600	1948	19:45	153	647	95	435	0	0	248	1082
08:00	155		402		0	0	557		20:00	126		75		0	0	201	
08:15	166		350		0	0	516		20:15	129		80		0	0	209	
08:30	197		341		0	0	538		20:30	95		64		0	0	159	
08:45	166	684	302	1395	0	0	468	2079	20:45	123	473	66	285	0	0	189	758
09:00	138		219		0	0	357		21:00	86		77		0	0	163	
09:15	109		207		0	0	316		21:15	76		81		0	0	157	
09:30	132		181		0	0	313		21:30	61		55		0	0	116	
09:45	120	499	174	781	0	0	294	1280	21:45	67	290	58	271	0	0	125	561
10:00	106		132		0	0	238		22:00	51		54		0	0	105	
10:15	104		134		0	0	238		22:15	51		39		0	0	90	
10:30	88		130		0	0	218		22:30	49		26		0	0	75	
10:45	112	410	100	496	0	0	212	906	22:45	31	182	20	139	0	0	51	321
11:00	137		119		0	0	256		23:00	28		52		0	0	80	
11:15	147		130		0	0	277		23:15	35		17		0	0	52	
11:30	173		116		0	0	289		23:30	28		17		0	0	45	
11:45	182	639	125	490	0	0	307	1129	23:45	19	110	14	100	0	0	33	210
TOTALS		3680		5781				**9461**	**TOTALS**		8058		5742				**13800**
SPLIT %		38.9%		61.1%				**40.7%**	**SPLIT %**		58.4%		41.6%				**59.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	11,738	11,523	0	0	23,261

AM Peak Hour	11:45	07:30			**07:45**	**PM Peak Hour**	17:00	16:30			**17:00**
AM Pk Volume	771	1512			**2211**	**PM Pk Volume**	1384	740			**2113**
Pk Hr Factor	0.959	0.922			**0.921**	**Pk Hr Factor**	0.832	0.894			**0.865**
7 - 9 Volume	1264	2763	0	0	**4027**	**4 - 6 Volume**	2479	1376	0	0	**3855**
7 - 9 Peak Hour	07:45	07:30			**07:45**	**4 - 6 Peak Hour**	17:00	16:30			**17:00**
7 - 9 Pk Volume	708	1512	0	0	**2211**	**4 - 6 Pk Volume**	1384	740	0	0	**2113**
Pk Hr Factor	0.898	0.922	0.000	0.000	**0.921**	**Pk Hr Factor**	0.832	0.894	0.000	0.000	**0.865**

Prepared by NDS/ATD

VOLUME

Alton Pkwy N/O Trabuco Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_036

DAILY TOTALS	NB	SB	EB	WB	Total
	12,015	12,367	0	0	24,382

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	14		20						34		12:00	144		159						303	
00:15	12		16						28		12:15	130		158						288	
00:30	17		13						30		12:30	167		186						353	
00:45	4	47	18	67					22	114	12:45	180	621	154	657					334	1278
01:00	9		8						17		13:00	166		146						312	
01:15	6		13						19		13:15	175		131						306	
01:30	6		14						20		13:30	172		138						310	
01:45	3	24	8	43					11	67	13:45	124	637	166	581					290	1218
02:00	4		14						18		14:00	141		168						309	
02:15	8		6						14		14:15	138		162						300	
02:30	9		10						19		14:30	213		172						385	
02:45	6	27	9	39					15	66	14:45	156	648	152	654					308	1302
03:00	3		8						11		15:00	172		190						362	
03:15	2		11						13		15:15	179		169						348	
03:30	8		15						23		15:30	277		238						515	
03:45	23	36	28	62					51	98	15:45	218	846	220	817					438	1663
04:00	11		13						24		16:00	257		254						511	
04:15	30		25						55		16:15	244		251						495	
04:30	62		62						124		16:30	239		292						531	
04:45	72	175	76	176					148	351	16:45	322	1062	264	1061					586	2123
05:00	27		48						75		17:00	339		363						702	
05:15	52		42						94		17:15	404		385						789	
05:30	37		67						104		17:30	388		340						728	
05:45	68	184	107	264					175	448	17:45	351	1482	318	1406					669	2888
06:00	52		85						137		18:00	310		267						577	
06:15	83		127						210		18:15	296		282						578	
06:30	94		173						267		18:30	189		213						402	
06:45	121	350	234	619					355	969	18:45	200	995	195	957					395	1952
07:00	166		156						322		19:00	148		214						362	
07:15	182		178						360		19:15	151		156						307	
07:30	218		159						377		19:30	145		142						287	
07:45	244	810	181	674					425	1484	19:45	124	568	134	646					258	1214
08:00	274		234						508		20:00	134		109						243	
08:15	255		227						482		20:15	131		98						229	
08:30	235		195						430		20:30	95		122						217	
08:45	214	978	213	869					427	1847	20:45	106	466	102	431					208	897
09:00	190		211						401		21:00	74		99						173	
09:15	154		140						294		21:15	70		74						144	
09:30	145		143						288		21:30	50		90						140	
09:45	116	605	130	624					246	1229	21:45	67	261	80	343					147	604
10:00	112		120						232		22:00	49		71						120	
10:15	90		102						192		22:15	49		65						114	
10:30	107		121						228		22:30	42		53						95	
10:45	112	421	127	470					239	891	22:45	35	175	48	237					83	412
11:00	82		135						217		23:00	29		38						67	
11:15	94		130						224		23:15	36		27						63	
11:30	151		134						285		23:30	31		23						54	
11:45	156	483	162	561					318	1044	23:45	18	114	21	109					39	223
TOTALS		4140		4468						8608	TOTALS		7875		7899						15774
SPLIT %		48.1%		51.9%						35.3%	SPLIT %		49.9%		50.1%						64.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	12,015	12,367	0	0	24,382

AM Peak Hour	07:45	08:00			08:00	PM Peak Hour	17:00	17:00			17:00
AM Pk Volume	1008	869			1847	PM Pk Volume	1482	1406			2888
Pk Hr Factor	0.920	0.928			0.909	Pk Hr Factor	0.917	0.913			0.915
7 - 9 Volume	1788	1543	0	0	3331	4 - 6 Volume	2544	2467	0	0	5011
7 - 9 Peak Hour	07:45	08:00			08:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	1008	869	0	0	1847	4 - 6 Pk Volume	1482	1406	0	0	2888
Pk Hr Factor	0.920	0.928	0.000	0.000	0.909	Pk Hr Factor	0.917	0.913	0.000	0.000	0.915

Prepared by NDS/ATD

VOLUME

Bake Pkwy S/O Towne Centre Drive

Day: Tuesday
Date: 4/10/2018

City: Lake Forest
Project #: CA18_1076_037

DAILY TOTALS	NB	SB	EB	WB	Total
	13,361	12,957	0	0	26,318

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	7		29						36		12:00	378		246						624	
00:15	17		22						39		12:15	291		254						545	
00:30	4		14						18		12:30	317		296						613	
00:45	6	34	10	75					16	109	12:45	256	1242	311	1107					567	2349
01:00	8		8						16		13:00	243		291						534	
01:15	9		7						16		13:15	210		312						522	
01:30	3		3						6		13:30	251		289						540	
01:45	12	32	8	26					20	58	13:45	199	903	275	1167					474	2070
02:00	6		11						17		14:00	180		238						418	
02:15	2		5						7		14:15	167		206						373	
02:30	6		3						9		14:30	187		222						409	
02:45	2	16	6	25					8	41	14:45	201	735	203	869					404	1604
03:00	4		6						10		15:00	179		203						382	
03:15	8		10						18		15:15	215		158						373	
03:30	14		13						27		15:30	195		223						418	
03:45	18	44	10	39					28	83	15:45	217	806	158	742					375	1548
04:00	14		12						26		16:00	246		199						445	
04:15	32		12						44		16:15	252		203						455	
04:30	69		24						93		16:30	264		202						466	
04:45	117	232	27	75					144	307	16:45	244	1006	219	823					463	1829
05:00	27		58						85		17:00	301		233						534	
05:15	35		63						98		17:15	314		241						555	
05:30	92		74						166		17:30	310		215						525	
05:45	103	257	69	264					172	521	17:45	293	1218	201	890					494	2108
06:00	59		67						126		18:00	298		239						537	
06:15	81		71						152		18:15	258		220						478	
06:30	110		135						245		18:30	267		217						484	
06:45	159	409	154	427					313	836	18:45	252	1075	225	901					477	1976
07:00	124		155						279		19:00	200		170						370	
07:15	146		191						337		19:15	193		197						390	
07:30	128		197						325		19:30	175		163						338	
07:45	167	565	219	762					386	1327	19:45	173	741	151	681					324	1422
08:00	217		233						450		20:00	137		157						294	
08:15	165		255						420		20:15	146		131						277	
08:30	171		217						388		20:30	141		137						278	
08:45	146	699	186	891					332	1590	20:45	122	546	137	562					259	1108
09:00	152		159						311		21:00	102		102						204	
09:15	158		151						309		21:15	90		113						203	
09:30	141		159						300		21:30	80		92						172	
09:45	149	600	170	639					319	1239	21:45	65	337	75	382					140	719
10:00	124		123						247		22:00	66		68						134	
10:15	128		148						276		22:15	48		58						106	
10:30	155		124						279		22:30	42		50						92	
10:45	168	575	127	522					295	1097	22:45	28	184	44	220					72	404
11:00	212		135						347		23:00	40		44						84	
11:15	232		162						394		23:15	17		33						50	
11:30	276		180						456		23:30	20		35						55	
11:45	293	1013	238	715					531	1728	23:45	15	92	41	153					56	245
TOTALS		4476		4460						8936	TOTALS		8885		8497						17382
SPLIT %		50.1%		49.9%						34.0%	SPLIT %		51.1%		48.9%						66.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	13,361	12,957	0	0	26,318

AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	12:00	12:30			12:00
AM Pk Volume	1279	1034			2313	PM Pk Volume	1242	1210			2349
Pk Hr Factor	0.846	0.873			0.927	Pk Hr Factor	0.821	0.970			0.941
7 - 9 Volume	1264	1653	0	0	2917	4 - 6 Volume	2224	1713	0	0	3937
7 - 9 Peak Hour	07:45	07:45			07:45	4 - 6 Peak Hour	17:00	16:45			17:00
7 - 9 Pk Volume	720	924	0	0	1644	4 - 6 Pk Volume	1218	908	0	0	2108
Pk Hr Factor	0.829	0.906	0.000	0.000	0.913	Pk Hr Factor	0.970	0.942	0.000	0.000	0.950

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Bake Pkwy N/O Commercentre Dr

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_038

DAILY TOTALS	NB	SB	EB	WB	Total
	14,874	14,756	0	0	29,630

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	22		25		0	0	47		12:00	299		249		0	0	548	
00:15	7		20		0	0	27		12:15	260		263		0	0	523	
00:30	9		15		0	0	24		12:30	261		294		0	0	555	
00:45	10	48	12	72	0	0	22	120	12:45	269	1089	289	1095	0	0	558	2184
01:00	9		12		0	0	21		13:00	239		293		0	0	532	
01:15	7		10		0	0	17		13:15	252		294		0	0	546	
01:30	13		11		0	0	24		13:30	197		277		0	0	474	
01:45	8	37	10	43	0	0	18	80	13:45	195	883	311	1175	0	0	506	2058
02:00	6		8		0	0	14		14:00	181		237		0	0	418	
02:15	3		8		0	0	11		14:15	211		215		0	0	426	
02:30	8		8		0	0	16		14:30	195		286		0	0	481	
02:45	4	21	7	31	0	0	11	52	14:45	204	791	251	989	0	0	455	1780
03:00	10		2		0	0	12		15:00	197		255		0	0	452	
03:15	11		7		0	0	18		15:15	228		216		0	0	444	
03:30	19		9		0	0	28		15:30	266		242		0	0	508	
03:45	30	70	20	38	0	0	50	108	15:45	222	913	222	935	0	0	444	1848
04:00	20		12		0	0	32		16:00	301		209		0	0	510	
04:15	43		19		0	0	62		16:15	286		205		0	0	491	
04:30	67		23		0	0	90		16:30	303		240		0	0	543	
04:45	130	260	44	98	0	0	174	358	16:45	306	1196	227	881	0	0	533	2077
05:00	56		68		0	0	124		17:00	341		274		0	0	615	
05:15	77		91		0	0	168		17:15	332		263		0	0	595	
05:30	113		94		0	0	207		17:30	359		232		0	0	591	
05:45	143	389	114	367	0	0	257	756	17:45	331	1363	225	994	0	0	556	2357
06:00	104		112		0	0	216		18:00	308		254		0	0	562	
06:15	129		145		0	0	274		18:15	269		242		0	0	511	
06:30	166		212		0	0	378		18:30	260		211		0	0	471	
06:45	164	563	241	710	0	0	405	1273	18:45	247	1084	192	899	0	0	439	1983
07:00	192		230		0	0	422		19:00	206		196		0	0	402	
07:15	156		237		0	0	393		19:15	200		159		0	0	359	
07:30	208		281		0	0	489		19:30	169		182		0	0	351	
07:45	264	820	341	1089	0	0	605	1909	19:45	167	742	143	680	0	0	310	1422
08:00	223		342		0	0	565		20:00	136		131		0	0	267	
08:15	263		319		0	0	582		20:15	164		120		0	0	284	
08:30	238		287		0	0	525		20:30	131		117		0	0	248	
08:45	218	942	264	1212	0	0	482	2154	20:45	134	565	104	472	0	0	238	1037
09:00	214		202		0	0	416		21:00	103		112		0	0	215	
09:15	175		179		0	0	354		21:15	93		127		0	0	220	
09:30	184		183		0	0	367		21:30	99		116		0	0	215	
09:45	187	760	247	811	0	0	434	1571	21:45	91	386	72	427	0	0	163	813
10:00	162		150		0	0	312		22:00	70		90		0	0	160	
10:15	134		159		0	0	293		22:15	68		70		0	0	138	
10:30	142		144		0	0	286		22:30	45		36		0	0	81	
10:45	178	616	138	591	0	0	316	1207	22:45	43	226	47	243	0	0	90	469
11:00	252		182		0	0	434		23:00	27		43		0	0	70	
11:15	223		191		0	0	414		23:15	32		29		0	0	61	
11:30	265		193		0	0	458		23:30	21		33		0	0	54	
11:45	268	1008	216	782	0	0	484	1790	23:45	22	102	17	122	0	0	39	224
TOTALS		5534		5844				11378	TOTALS		9340		8912				18252
SPLIT %		48.6%		51.4%				38.4%	SPLIT %		51.2%		48.8%				61.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	14,874	14,756	0	0	29,630

AM Peak Hour	11:30	07:45			07:45	PM Peak Hour	17:00	13:00			17:00
AM Pk Volume	1092	1289			2277	PM Pk Volume	1363	1175			2357
Pk Hr Factor	0.913	0.942			0.941	Pk Hr Factor	0.949	0.945			0.958
7 - 9 Volume	1762	2301	0	0	4063	4 - 6 Volume	2559	1875	0	0	4434
7 - 9 Peak Hour	07:45	07:45			07:45	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	988	1289	0	0	2277	4 - 6 Pk Volume	1363	1004	0	0	2357
Pk Hr Factor	0.936	0.942	0.000	0.000	0.941	Pk Hr Factor	0.949	0.916	0.000	0.000	0.958

Prepared by NDS/ATD

VOLUME

Bake Pkwy S/O Commercentre Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_039

DAILY TOTALS	NB	SB	EB	WB	Total
	16,968	15,367	0	0	32,335

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	21		30						51		12:00	238		227						465	
00:15	38		31						69		12:15	236		182						418	
00:30	19		16						35		12:30	252		220						472	
00:45	15	93	17	94					32	187	12:45	227	953	239	868					466	1821
01:00	8		19						27		13:00	254		212						466	
01:15	15		13						28		13:15	204		223						427	
01:30	16		40						56		13:30	275		246						521	
01:45	13	52	14	86					27	138	13:45	200	933	272	953					472	1886
02:00	7		18						25		14:00	228		221						449	
02:15	10		21						31		14:15	225		196						421	
02:30	17		16						33		14:30	202		344						546	
02:45	14	48	10	65					24	113	14:45	236	891	255	1016					491	1907
03:00	12		13						25		15:00	228		258						486	
03:15	23		6						29		15:15	223		238						461	
03:30	19		10						29		15:30	235		286						521	
03:45	52	106	9	38					61	144	15:45	223	909	303	1085					526	1994
04:00	21		20						41		16:00	275		359						634	
04:15	69		19						88		16:15	284		310						594	
04:30	102		43						145		16:30	289		338						627	
04:45	156	348	42	124					198	472	16:45	311	1159	318	1325					629	2484
05:00	105		62						167		17:00	321		414						735	
05:15	121		103						224		17:15	362		325						687	
05:30	171		108						279		17:30	359		319						678	
05:45	311	708	105	378					416	1086	17:45	354	1396	295	1353					649	2749
06:00	166		103						269		18:00	306		339						645	
06:15	206		129						335		18:15	266		272						538	
06:30	250		197						447		18:30	277		269						546	
06:45	343	965	202	631					545	1596	18:45	226	1075	244	1124					470	2199
07:00	270		222						492		19:00	186		224						410	
07:15	330		238						568		19:15	172		180						352	
07:30	359		246						605		19:30	171		153						324	
07:45	377	1336	299	1005					676	2341	19:45	178	707	141	698					319	1405
08:00	357		318						675		20:00	156		164						320	
08:15	345		253						598		20:15	141		116						257	
08:30	338		249						587		20:30	162		96						258	
08:45	355	1395	226	1046					581	2441	20:45	122	581	103	479					225	1060
09:00	293		176						469		21:00	92		117						209	
09:15	226		186						412		21:15	106		135						241	
09:30	250		155						405		21:30	80		124						204	
09:45	208	977	156	673					364	1650	21:45	60	338	75	451					135	789
10:00	215		177						392		22:00	64		64						128	
10:15	171		161						332		22:15	71		62						133	
10:30	204		141						345		22:30	52		72						124	
10:45	177	767	149	628					326	1395	22:45	50	237	43	241					93	478
11:00	220		186						406		23:00	52		89						141	
11:15	173		150						323		23:15	27		54						81	
11:30	233		241						474		23:30	16		60						76	
11:45	247	873	203	780					450	1653	23:45	26	121	23	226					49	347
TOTALS		7668		5548						13216	TOTALS		9300		9819						19119
SPLIT %		58.0%		42.0%						40.9%	SPLIT %		48.6%		51.4%						59.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	16,968	15,367	0	0	32,335

AM Peak Hour	07:30	07:45			07:30	PM Peak Hour	17:00	16:30			17:00
AM Pk Volume	1438	1119			2554	PM Pk Volume	1396	1395			2749
Pk Hr Factor	0.954	0.880			0.945	Pk Hr Factor	0.964	0.842			0.935
7 - 9 Volume	2731	2051	0	0	4782	4 - 6 Volume	2555	2678	0	0	5233
7 - 9 Peak Hour	07:30	07:45			07:30	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	1438	1119	0	0	2554	4 - 6 Pk Volume	1396	1395	0	0	2749
Pk Hr Factor	0.954	0.880	0.000	0.000	0.945	Pk Hr Factor	0.964	0.842	0.000	0.000	0.935

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Bake Pkwy S/O Trabuco Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_040

DAILY TOTALS	NB	SB	EB	WB	Total
	23,850	22,312	0	0	46,162

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	28		46		0	0	74		12:00	324		329		0	0	653	
00:15	21		29		0	0	50		12:15	297		319		0	0	616	
00:30	17		14		0	0	31		12:30	315		347		0	0	662	
00:45	18	84	25	114	0	0	43	198	12:45	313	1249	321	1316	0	0	634	2565
01:00	20		32		0	0	52		13:00	286		329		0	0	615	
01:15	22		30		0	0	52		13:15	336		373		0	0	709	
01:30	13		31		0	0	44		13:30	254		345		0	0	599	
01:45	20	75	11	104	0	0	31	179	13:45	361	1237	321	1368	0	0	682	2605
02:00	9		15		0	0	24		14:00	276		383		0	0	659	
02:15	8		15		0	0	23		14:15	306		325		0	0	631	
02:30	10		16		0	0	26		14:30	331		471		0	0	802	
02:45	23	50	9	55	0	0	32	105	14:45	328	1241	413	1592	0	0	741	2833
03:00	12		8		0	0	20		15:00	332		404		0	0	736	
03:15	20		7		0	0	27		15:15	343		338		0	0	681	
03:30	44		23		0	0	67		15:30	340		471		0	0	811	
03:45	57	133	30	68	0	0	87	201	15:45	361	1376	340	1553	0	0	701	2929
04:00	37		28		0	0	65		16:00	409		389		0	0	798	
04:15	59		30		0	0	89		16:15	406		380		0	0	786	
04:30	157		34		0	0	191		16:30	379		429		0	0	808	
04:45	199	452	74	166	0	0	273	618	16:45	453	1647	386	1584	0	0	839	3231
05:00	117		105		0	0	222		17:00	421		533		0	0	954	
05:15	167		129		0	0	296		17:15	503		417		0	0	920	
05:30	317		126		0	0	443		17:30	463		416		0	0	879	
05:45	394	995	162	522	0	0	556	1517	17:45	465	1852	378	1744	0	0	843	3596
06:00	290		193		0	0	483		18:00	437		433		0	0	870	
06:15	355		243		0	0	598		18:15	394		390		0	0	784	
06:30	356		317		0	0	673		18:30	385		348		0	0	733	
06:45	448	1449	358	1111	0	0	806	2560	18:45	342	1558	326	1497	0	0	668	3055
07:00	385		390		0	0	775		19:00	279		287		0	0	566	
07:15	414		455		0	0	869		19:15	268		272		0	0	540	
07:30	432		445		0	0	877		19:30	278		244		0	0	522	
07:45	468	1699	418	1708	0	0	886	3407	19:45	266	1091	217	1020	0	0	483	2111
08:00	467		419		0	0	886		20:00	219		170		0	0	389	
08:15	420		410		0	0	830		20:15	205		199		0	0	404	
08:30	482		396		0	0	878		20:30	201		144		0	0	345	
08:45	454	1823	380	1605	0	0	834	3428	20:45	214	839	120	633	0	0	334	1472
09:00	422		346		0	0	768		21:00	184		135		0	0	319	
09:15	370		319		0	0	689		21:15	194		182		0	0	376	
09:30	364		296		0	0	660		21:30	143		138		0	0	281	
09:45	332	1488	319	1280	0	0	651	2768	21:45	158	679	123	578	0	0	281	1257
10:00	276		231		0	0	507		22:00	103		112		0	0	215	
10:15	260		269		0	0	529		22:15	123		80		0	0	203	
10:30	262		254		0	0	516		22:30	109		84		0	0	193	
10:45	266	1064	253	1007	0	0	519	2071	22:45	85	420	61	337	0	0	146	757
11:00	286		305		0	0	591		23:00	64		69		0	0	133	
11:15	264		300		0	0	564		23:15	49		45		0	0	94	
11:30	308		285		0	0	593		23:30	43		35		0	0	78	
11:45	309	1167	284	1174	0	0	593	2341	23:45	26	182	27	176	0	0	53	358
TOTALS		10479		8914				19393	TOTALS		13371		13398				26769
SPLIT %		54.0%		46.0%				42.0%	SPLIT %		49.9%		50.1%				58.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	23,850	22,312	0	0	46,162

AM Peak Hour	07:45	07:15			07:15	PM Peak Hour	17:15	16:30			17:00
AM Pk Volume	1837	1737			3518	PM Pk Volume	1868	1765			3596
Pk Hr Factor	0.953	0.954			0.993	Pk Hr Factor	0.928	0.828			0.942
7 - 9 Volume	3522	3313	0	0	6835	4 - 6 Volume	3499	3328	0	0	6827
7 - 9 Peak Hour	07:45	07:15			07:15	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	1837	1737	0	0	3518	4 - 6 Pk Volume	1852	1765	0	0	3596
Pk Hr Factor	0.953	0.954	0.000	0.000	0.993	Pk Hr Factor	0.920	0.828	0.000	0.000	0.942

Prepared by NDS/ATD

VOLUME

Bake Pkwy S/O Toledo Way

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_041

DAILY TOTALS	NB	SB	EB	WB	Total
	25,386	23,882	0	0	49,268

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	41		75						116		12:00	310		338						648	
00:15	21		42						63		12:15	279		358						637	
00:30	20		30						50		12:30	338		347						685	
00:45	26	108	27	174					53	282	12:45	319	1246	287	1330					606	2576
01:00	25		36						61		13:00	344		344						688	
01:15	19		38						57		13:15	324		353						677	
01:30	13		38						51		13:30	267		447						714	
01:45	17	74	17	129					34	203	13:45	388	1323	333	1477					721	2800
02:00	11		30						41		14:00	321		417						738	
02:15	12		13						25		14:15	281		333						614	
02:30	16		16						32		14:30	325		577						902	
02:45	22	61	17	76					39	137	14:45	332	1259	502	1829					834	3088
03:00	19		13						32		15:00	353		468						821	
03:15	21		21						42		15:15	366		430						796	
03:30	86		19						105		15:30	363		527						890	
03:45	88	214	24	77					112	291	15:45	400	1482	409	1834					809	3316
04:00	55		31						86		16:00	405		467						872	
04:15	91		34						125		16:15	435		426						861	
04:30	204		46						250		16:30	366		511						877	
04:45	274	624	83	194					357	818	16:45	507	1713	439	1843					946	3556
05:00	146		115						261		17:00	405		530						935	
05:15	203		118						321		17:15	518		506						1024	
05:30	338		151						489		17:30	505		457						962	
05:45	483	1170	170	554					653	1724	17:45	484	1912	393	1886					877	3798
06:00	324		200						524		18:00	450		456						906	
06:15	338		256						594		18:15	419		420						839	
06:30	401		304						705		18:30	420		358						778	
06:45	502	1565	373	1133					875	2698	18:45	356	1645	331	1565					687	3210
07:00	432		365						797		19:00	313		280						593	
07:15	474		500						974		19:15	251		250						501	
07:30	457		463						920		19:30	298		258						556	
07:45	581	1944	496	1824					1077	3768	19:45	268	1130	202	990					470	2120
08:00	462		420						882		20:00	233		198						431	
08:15	474		451						925		20:15	237		185						422	
08:30	532		469						1001		20:30	235		141						376	
08:45	485	1953	378	1718					863	3671	20:45	223	928	114	638					337	1566
09:00	449		369						818		21:00	184		140						324	
09:15	356		297						653		21:15	214		161						375	
09:30	427		322						749		21:30	170		129						299	
09:45	321	1553	308	1296					629	2849	21:45	163	731	128	558					291	1289
10:00	309		263						572		22:00	111		92						203	
10:15	250		247						497		22:15	102		87						189	
10:30	289		279						568		22:30	85		79						164	
10:45	232	1080	241	1030					473	2110	22:45	78	376	71	329					149	705
11:00	282		296						578		23:00	62		87						149	
11:15	237		287						524		23:15	41		54						95	
11:30	312		308						620		23:30	39		54						93	
11:45	280	1111	279	1170					559	2281	23:45	42	184	33	228					75	412
TOTALS		11457		9375						20832	TOTALS		13929		14507						28436
SPLIT %		55.0%		45.0%						42.3%	SPLIT %		49.0%		51.0%						57.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	25,386	23,882	0	0	49,268

AM Peak Hour	07:45	07:15			07:45	PM Peak Hour	17:15	16:30			16:45
AM Pk Volume	2049	1879			3885	PM Pk Volume	1957	1986			3867
Pk Hr Factor	0.882	0.940			0.902	Pk Hr Factor	0.944	0.937			0.944
7 - 9 Volume	3897	3542	0	0	7439	4 - 6 Volume	3625	3729	0	0	7354
7 - 9 Peak Hour	07:45	07:15			07:45	4 - 6 Peak Hour	16:45	16:30			16:45
7 - 9 Pk Volume	2049	1879	0	0	3885	4 - 6 Pk Volume	1935	1986	0	0	3867
Pk Hr Factor	0.882	0.940	0.000	0.000	0.902	Pk Hr Factor	0.934	0.937	0.000	0.000	0.944

Prepared by NDS/ATD

VOLUME

Lake Forest Dr S/O Portola Blvd

Day: Thursday
Date: 4/12/2018

City: Lake Forest
Project #: CA18_1076_042

DAILY TOTALS	NB	SB	EB	WB	Total
	4,753	4,749	0	0	9,502

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	10		6						16		12:00	98		114						212	
00:15	6		4						10		12:15	80		87						167	
00:30	5		5						10		12:30	85		103						188	
00:45	6	27	7	22					13	49	12:45	77	340	98	402					175	742
01:00	5		4						9		13:00	68		110						178	
01:15	3		3						6		13:15	63		101						164	
01:30	2		2						4		13:30	53		98						151	
01:45	3	13	1	10					4	23	13:45	70	254	75	384					145	638
02:00	2		2						4		14:00	51		62						113	
02:15	1		0						1		14:15	90		79						169	
02:30	2		3						5		14:30	70		90						160	
02:45	1	6	1	6					2	12	14:45	58	269	77	308					135	577
03:00	4		4						8		15:00	79		95						174	
03:15	3		1						4		15:15	107		84						191	
03:30	4		4						8		15:30	59		85						144	
03:45	5	16	3	12					8	28	15:45	90	335	83	347					173	682
04:00	6		3						9		16:00	93		92						185	
04:15	8		3						11		16:15	111		72						183	
04:30	14		8						22		16:30	102		83						185	
04:45	35	63	9	23					44	86	16:45	132	438	95	342					227	780
05:00	9		13						22		17:00	137		124						261	
05:15	12		18						30		17:15	150		93						243	
05:30	17		12						29		17:30	114		79						193	
05:45	31	69	23	66					54	135	17:45	108	509	87	383					195	892
06:00	28		33						61		18:00	103		78						181	
06:15	35		25						60		18:15	88		60						148	
06:30	44		49						93		18:30	79		70						149	
06:45	52	159	56	163					108	322	18:45	78	348	61	269					139	617
07:00	60		59						119		19:00	67		59						126	
07:15	58		55						113		19:15	66		51						117	
07:30	66		83						149		19:30	71		46						117	
07:45	97	281	76	273					173	554	19:45	47	251	38	194					85	445
08:00	87		106						193		20:00	51		42						93	
08:15	92		93						185		20:15	47		29						76	
08:30	63		74						137		20:30	42		34						76	
08:45	57	299	80	353					137	652	20:45	45	185	31	136					76	321
09:00	53		85						138		21:00	34		28						62	
09:15	49		91						140		21:15	28		27						55	
09:30	48		59						107		21:30	25		16						41	
09:45	54	204	84	319					138	523	21:45	22	109	11	82					33	191
10:00	54		67						121		22:00	26		7						33	
10:15	67		72						139		22:15	30		5						35	
10:30	44		66						110		22:30	24		8						32	
10:45	45	210	86	291					131	501	22:45	14	94	13	33					27	127
11:00	61		69						130		23:00	10		8						18	
11:15	64		69						133		23:15	6		5						11	
11:30	51		91						142		23:30	9		3						12	
11:45	67	243	83	312					150	555	23:45	6	31	3	19					9	50
TOTALS		1590		1850						3440	TOTALS		3163		2899						6062
SPLIT %		46.2%		53.8%						36.2%	SPLIT %		52.2%		47.8%						63.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	4,753	4,749	0	0	9,502

AM Peak Hour	07:30	11:45			11:45	PM Peak Hour	16:45	12:30			16:45
AM Pk Volume	342	387			717	PM Pk Volume	533	412			924
Pk Hr Factor	0.881	0.849			0.846	Pk Hr Factor	0.888	0.936			0.885
7 - 9 Volume	580	626	0	0	1206	4 - 6 Volume	947	725	0	0	1672
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:45	16:30			16:45
7 - 9 Pk Volume	342	358	0	0	700	4 - 6 Pk Volume	533	395	0	0	924
Pk Hr Factor	0.881	0.844	0.000	0.000	0.907	Pk Hr Factor	0.888	0.796	0.000	0.000	0.885

Prepared by NDS/ATD

VOLUME

Lake Forest Dr N/O Rancho Pkwy

Day: Tuesday
Date: 4/10/2018

City: Lake Forest
Project #: CA18_1076_043

DAILY TOTALS	NB	SB	EB	WB	Total
	9,063	9,430	0	0	18,493

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	10		8						18		12:00	180		173						353	
00:15	6		11						17		12:15	159		177						336	
00:30	7		10						17		12:30	191		175						366	
00:45	6	29	7	36					13	65	12:45	184	714	211	736					395	1450
01:00	6		5						11		13:00	185		209						394	
01:15	7		7						14		13:15	163		176						339	
01:30	4		2						6		13:30	167		190						357	
01:45	2	19	8	22					10	41	13:45	139	654	174	749					313	1403
02:00	5		2						7		14:00	121		155						276	
02:15	3		0						3		14:15	121		137						258	
02:30	1		3						4		14:30	140		172						312	
02:45	0	9	3	8					3	17	14:45	135	517	161	625					296	1142
03:00	3		3						6		15:00	176		166						342	
03:15	3		0						3		15:15	151		144						295	
03:30	11		6						17		15:30	183		166						349	
03:45	6	23	3	12					9	35	15:45	206	716	158	634					364	1350
04:00	7		8						15		16:00	197		160						357	
04:15	5		11						16		16:15	174		156						330	
04:30	21		15						36		16:30	222		196						418	
04:45	34	67	22	56					56	123	16:45	206	799	186	698					392	1497
05:00	17		17						34		17:00	216		235						451	
05:15	28		27						55		17:15	223		200						423	
05:30	26		34						60		17:30	208		186						394	
05:45	62	133	37	115					99	248	17:45	211	858	174	795					385	1653
06:00	46		57						103		18:00	211		184						395	
06:15	58		57						115		18:15	162		158						320	
06:30	61		70						131		18:30	164		155						319	
06:45	94	259	108	292					202	551	18:45	127	664	144	641					271	1305
07:00	99		82						181		19:00	123		143						266	
07:15	126		126						252		19:15	116		144						260	
07:30	130		154						284		19:30	97		124						221	
07:45	164	519	167	529					331	1048	19:45	86	422	96	507					182	929
08:00	147		145						292		20:00	116		102						218	
08:15	133		143						276		20:15	74		73						147	
08:30	152		148						300		20:30	88		98						186	
08:45	130	562	149	585					279	1147	20:45	66	344	69	342					135	686
09:00	102		128						230		21:00	56		90						146	
09:15	113		160						273		21:15	44		58						102	
09:30	101		118						219		21:30	30		65						95	
09:45	116	432	136	542					252	974	21:45	36	166	43	256					79	422
10:00	103		133						236		22:00	45		27						72	
10:15	102		132						234		22:15	22		40						62	
10:30	114		111						225		22:30	23		25						48	
10:45	116	435	109	485					225	920	22:45	16	106	16	108					32	214
11:00	129		129						258		23:00	18		24						42	
11:15	148		137						285		23:15	12		23						35	
11:30	144		142						286		23:30	10		12						22	
11:45	146	567	173	581					319	1148	23:45	9	49	17	76					26	125
TOTALS		3054		3263						6317	TOTALS		6009		6167						12176
SPLIT %		48.3%		51.7%						34.2%	SPLIT %		49.4%		50.6%						65.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	9,063	9,430	0	0	18,493

AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	16:30	16:30			16:30
AM Pk Volume	676	698			1374	PM Pk Volume	867	817			1684
Pk Hr Factor	0.885	0.986			0.939	Pk Hr Factor	0.972	0.869			0.933
7 - 9 Volume	1081	1114	0	0	2195	4 - 6 Volume	1657	1493	0	0	3150
7 - 9 Peak Hour	07:45	07:30			07:45	4 - 6 Peak Hour	16:30	16:30			16:30
7 - 9 Pk Volume	596	609	0	0	1199	4 - 6 Pk Volume	867	817	0	0	1684
Pk Hr Factor	0.909	0.912	0.000	0.000	0.906	Pk Hr Factor	0.972	0.869	0.000	0.000	0.933

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Lake Forest Dr S/O Rancho Pkwy

Day: Tuesday
Date: 4/10/2018

City: Lake Forest
Project #: CA18_1076_044

DAILY TOTALS	NB	SB	EB	WB	Total
	10,970	9,924	0	0	20,894

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	8		10		0	0	18		12:00	199		171		0	0	370	
00:15	7		10		0	0	17		12:15	181		165		0	0	346	
00:30	9		12		0	0	21		12:30	179		150		0	0	329	
00:45	6	30	6	38	0	0	12	68	12:45	188	747	193	679	0	0	381	1426
01:00	7		4		0	0	11		13:00	169		181		0	0	350	
01:15	6		6		0	0	12		13:15	159		170		0	0	329	
01:30	6		2		0	0	8		13:30	177		176		0	0	353	
01:45	3	22	10	22	0	0	13	44	13:45	151	656	159	686	0	0	310	1342
02:00	5		4		0	0	9		14:00	149		176		0	0	325	
02:15	6		2		0	0	8		14:15	138		158		0	0	296	
02:30	2		4		0	0	6		14:30	163		161		0	0	324	
02:45	1	14	2	12	0	0	3	26	14:45	160	610	154	649	0	0	314	1259
03:00	2		2		0	0	4		15:00	200		151		0	0	351	
03:15	5		4		0	0	9		15:15	180		158		0	0	338	
03:30	12		4		0	0	16		15:30	202		177		0	0	379	
03:45	10	29	7	17	0	0	17	46	15:45	214	796	149	635	0	0	363	1431
04:00	7		9		0	0	16		16:00	229		148		0	0	377	
04:15	9		12		0	0	21		16:15	214		149		0	0	363	
04:30	29		14		0	0	43		16:30	249		168		0	0	417	
04:45	57	102	25	60	0	0	82	162	16:45	264	956	195	660	0	0	459	1616
05:00	25		13		0	0	38		17:00	297		246		0	0	543	
05:15	44		36		0	0	80		17:15	273		201		0	0	474	
05:30	45		33		0	0	78		17:30	278		181		0	0	459	
05:45	77	191	48	130	0	0	125	321	17:45	242	1090	159	787	0	0	401	1877
06:00	64		75		0	0	139		18:00	252		185		0	0	437	
06:15	67		71		0	0	138		18:15	220		160		0	0	380	
06:30	71		74		0	0	145		18:30	187		167		0	0	354	
06:45	145	347	116	336	0	0	261	683	18:45	154	813	174	686	0	0	328	1499
07:00	125		109		0	0	234		19:00	178		159		0	0	337	
07:15	157		149		0	0	306		19:15	131		146		0	0	277	
07:30	157		163		0	0	320		19:30	146		138		0	0	284	
07:45	213	652	207	628	0	0	420	1280	19:45	125	580	111	554	0	0	236	1134
08:00	200		182		0	0	382		20:00	148		99		0	0	247	
08:15	182		178		0	0	360		20:15	124		99		0	0	223	
08:30	172		175		0	0	347		20:30	116		105		0	0	221	
08:45	170	724	160	695	0	0	330	1419	20:45	90	478	100	403	0	0	190	881
09:00	127		184		0	0	311		21:00	65		102		0	0	167	
09:15	135		166		0	0	301		21:15	65		78		0	0	143	
09:30	131		137		0	0	268		21:30	55		79		0	0	134	
09:45	141	534	154	641	0	0	295	1175	21:45	50	235	63	322	0	0	113	557
10:00	121		114		0	0	235		22:00	53		37		0	0	90	
10:15	129		117		0	0	246		22:15	40		56		0	0	96	
10:30	150		113		0	0	263		22:30	33		47		0	0	80	
10:45	126	526	116	460	0	0	242	986	22:45	22	148	19	159	0	0	41	307
11:00	150		133		0	0	283		23:00	25		27		0	0	52	
11:15	150		136		0	0	286		23:15	21		30		0	0	51	
11:30	162		129		0	0	291		23:30	11		19		0	0	30	
11:45	155	617	173	571	0	0	328	1188	23:45	16	73	18	94	0	0	34	167
TOTALS		3788		3610				**7398**	**TOTALS**		7182		6314				**13496**
SPLIT %		51.2%		48.8%				**35.4%**	**SPLIT %**		53.2%		46.8%				**64.6%**

DAILY TOTALS	NB	SB	EB	WB	Total
	10,970	9,924	0	0	20,894

AM Peak Hour	07:45	07:45			**07:45**	**PM Peak Hour**	16:45	16:45			**16:45**
AM Pk Volume	767	742			**1509**	**PM Pk Volume**	1112	823			**1935**
Pk Hr Factor	0.900	0.896			**0.898**	**Pk Hr Factor**	0.936	0.836			**0.891**
7 - 9 Volume	1376	1323	0	0	**2699**	**4 - 6 Volume**	2046	1447	0	0	**3493**
7 - 9 Peak Hour	07:45	07:45			**07:45**	**4 - 6 Peak Hour**	16:45	16:45			**16:45**
7 - 9 Pk Volume	767	742	0	0	**1509**	**4 - 6 Pk Volume**	1112	823	0	0	**1935**
Pk Hr Factor	0.900	0.896	0.000	0.000	**0.898**	**Pk Hr Factor**	0.936	0.836	0.000	0.000	**0.891**

Prepared by NDS/ATD

VOLUME

Lake Forest Dr N/O Trabuco Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_045

DAILY TOTALS	NB	SB	EB	WB	Total
	16,267	15,400	0	0	31,667

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	24		20						44		12:00	227		250						477	
00:15	18		17						35		12:15	212		215						427	
00:30	24		17						41		12:30	273		218						491	
00:45	11	77	14	68					25	145	12:45	264	976	237	920					501	1896
01:00	23		9						32		13:00	223		210						433	
01:15	11		8						19		13:15	217		196						413	
01:30	7		11						18		13:30	217		221						438	
01:45	9	50	7	35					16	85	13:45	220	877	206	833					426	1710
02:00	8		11						19		14:00	201		230						431	
02:15	6		10						16		14:15	253		219						472	
02:30	10		8						18		14:30	249		299						548	
02:45	5	29	11	40					16	69	14:45	254	957	265	1013					519	1970
03:00	6		6						12		15:00	313		282						595	
03:15	7		8						15		15:15	323		219						542	
03:30	16		18						34		15:30	275		285						560	
03:45	7	36	10	42					17	78	15:45	281	1192	256	1042					537	2234
04:00	7		17						24		16:00	335		298						633	
04:15	23		26						49		16:15	325		235						560	
04:30	44		52						96		16:30	378		324						702	
04:45	46	120	53	148					99	268	16:45	348	1386	272	1129					620	2515
05:00	26		47						73		17:00	374		354						728	
05:15	49		79						128		17:15	405		359						764	
05:30	57		89						146		17:30	393		321						714	
05:45	110	242	121	336					231	578	17:45	421	1593	276	1310					697	2903
06:00	85		126						211		18:00	322		260						582	
06:15	105		167						272		18:15	381		249						630	
06:30	136		202						338		18:30	290		224						514	
06:45	194	520	241	736					435	1256	18:45	310	1303	223	956					533	2259
07:00	173		283						456		19:00	291		196						487	
07:15	197		308						505		19:15	244		162						406	
07:30	250		351						601		19:30	219		184						403	
07:45	374	994	407	1349					781	2343	19:45	200	954	141	683					341	1637
08:00	297		330						627		20:00	187		142						329	
08:15	315		280						595		20:15	197		153						350	
08:30	278		270						548		20:30	187		126						313	
08:45	230	1120	250	1130					480	2250	20:45	156	727	116	537					272	1264
09:00	180		227						407		21:00	155		85						240	
09:15	186		169						355		21:15	129		109						238	
09:30	198		218						416		21:30	135		91						226	
09:45	212	776	224	838					436	1614	21:45	119	538	69	354					188	892
10:00	187		207						394		22:00	103		95						198	
10:15	182		195						377		22:15	102		52						154	
10:30	144		194						338		22:30	68		39						107	
10:45	144	657	145	741					289	1398	22:45	37	310	21	207					58	517
11:00	142		197						339		23:00	44		43						87	
11:15	149		226						375		23:15	35		30						65	
11:30	198		204						402		23:30	37		25						62	
11:45	196	685	209	836					405	1521	23:45	32	148	19	117					51	265
TOTALS		5306		6299						11605	TOTALS		10961		9101						20062
SPLIT %		45.7%		54.3%						36.6%	SPLIT %		54.6%		45.4%						63.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	16,267	15,400	0	0	31,667

AM Peak Hour	07:45	07:15			07:30	PM Peak Hour	17:00	17:00			17:00
AM Pk Volume	1264	1396			2604	PM Pk Volume	1593	1310			2903
Pk Hr Factor	0.845	0.857			0.834	Pk Hr Factor	0.946	0.912			0.950
7 - 9 Volume	2114	2479	0	0	4593	4 - 6 Volume	2979	2439	0	0	5418
7 - 9 Peak Hour	07:45	07:15			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	1264	1396	0	0	2604	4 - 6 Pk Volume	1593	1310	0	0	2903
Pk Hr Factor	0.845	0.857	0.000	0.000	0.834	Pk Hr Factor	0.946	0.912	0.000	0.000	0.950

Prepared by NDS/ATD

VOLUME

Lake Forest Dr S/O Trabuco Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_046

DAILY TOTALS	NB	SB	EB	WB	Total
	15,703	15,475	0	0	31,178

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	21		15						36		12:00	216		230						446	
00:15	18		24						42		12:15	226		211						437	
00:30	20		17						37		12:30	251		226						477	
00:45	20	79	9	65					29	144	12:45	213	906	166	833					379	1739
01:00	18		7						25		13:00	191		201						392	
01:15	9		6						15		13:15	204		191						395	
01:30	10		12						22		13:30	204		216						420	
01:45	16	53	6	31					22	84	13:45	224	823	208	816					432	1639
02:00	10		5						15		14:00	203		214						417	
02:15	8		7						15		14:15	229		241						470	
02:30	9		6						15		14:30	276		255						531	
02:45	9	36	5	23					14	59	14:45	296	1004	238	948					534	1952
03:00	6		9						15		15:00	347		244						591	
03:15	10		7						17		15:15	334		214						548	
03:30	17		22						39		15:30	268		239						507	
03:45	12	45	15	53					27	98	15:45	286	1235	255	952					541	2187
04:00	15		18						33		16:00	306		288						594	
04:15	17		33						50		16:15	372		249						621	
04:30	37		49						86		16:30	369		266						635	
04:45	52	121	64	164					116	285	16:45	337	1384	303	1106					640	2490
05:00	31		59						90		17:00	406		381						787	
05:15	40		74						114		17:15	393		366						759	
05:30	54		90						144		17:30	430		305						735	
05:45	107	232	130	353					237	585	17:45	453	1682	268	1320					721	3002
06:00	82		139						221		18:00	354		233						587	
06:15	110		173						283		18:15	343		201						544	
06:30	124		222						346		18:30	265		183						448	
06:45	143	459	312	846					455	1305	18:45	302	1264	166	783					468	2047
07:00	159		333						492		19:00	222		170						392	
07:15	145		361						506		19:15	268		144						412	
07:30	207		410						617		19:30	206		138						344	
07:45	272	783	509	1613					781	2396	19:45	173	869	135	587					308	1456
08:00	261		431						692		20:00	184		106						290	
08:15	334		444						778		20:15	182		118						300	
08:30	264		312						576		20:30	184		111						295	
08:45	192	1051	318	1505					510	2556	20:45	154	704	96	431					250	1135
09:00	157		240						397		21:00	137		77						214	
09:15	154		214						368		21:15	128		71						199	
09:30	142		219						361		21:30	138		61						199	
09:45	175	628	225	898					400	1526	21:45	107	510	63	272					170	782
10:00	148		210						358		22:00	98		66						164	
10:15	157		208						365		22:15	103		50						153	
10:30	164		199						363		22:30	73		40						113	
10:45	148	617	187	804					335	1421	22:45	67	341	29	185					96	526
11:00	144		178						322		23:00	41		33						74	
11:15	158		195						353		23:15	40		20						60	
11:30	221		206						427		23:30	48		24						72	
11:45	197	720	212	791					409	1511	23:45	28	157	19	96					47	253
TOTALS		4824		7146						11970	TOTALS		10879		8329						19208
SPLIT %		40.3%		59.7%						38.4%	SPLIT %		56.6%		43.4%						61.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	15,703	15,475	0	0	31,178

AM Peak Hour	07:45	07:30			07:30	PM Peak Hour	17:00	16:45			17:00
AM Pk Volume	1131	1794			2868	PM Pk Volume	1682	1355			3002
Pk Hr Factor	0.847	0.881			0.918	Pk Hr Factor	0.928	0.889			0.954
7 - 9 Volume	1834	3118	0	0	4952	4 - 6 Volume	3066	2426	0	0	5492
7 - 9 Peak Hour	07:45	07:30			07:30	4 - 6 Peak Hour	17:00	16:45			17:00
7 - 9 Pk Volume	1131	1794	0	0	2868	4 - 6 Pk Volume	1682	1355	0	0	3002
Pk Hr Factor	0.847	0.881	0.000	0.000	0.918	Pk Hr Factor	0.928	0.889	0.000	0.000	0.954

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Lake Forest Dr N/O Jeronimo Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_047

DAILY TOTALS	NB	SB	EB	WB	Total
	16,990	16,037	0	0	33,027

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	27		2		0	0	29		12:00	233		259		0	0	492	
00:15	22		4		0	0	26		12:15	232		207		0	0	439	
00:30	16		18		0	0	34		12:30	269		263		0	0	532	
00:45	18	83	8	32	0	0	26	115	12:45	236	970	239	968	0	0	475	1938
01:00	21		6		0	0	27		13:00	229		219		0	0	448	
01:15	9		5		0	0	14		13:15	229		198		0	0	427	
01:30	16		11		0	0	27		13:30	210		228		0	0	438	
01:45	15	61	5	27	0	0	20	88	13:45	266	934	234	879	0	0	500	1813
02:00	13		7		0	0	20		14:00	237		204		0	0	441	
02:15	8		5		0	0	13		14:15	235		250		0	0	485	
02:30	10		5		0	0	15		14:30	272		322		0	0	594	
02:45	8	39	4	21	0	0	12	60	14:45	283	1027	301	1077	0	0	584	2104
03:00	10		7		0	0	17		15:00	399		346		0	0	745	
03:15	13		5		0	0	18		15:15	320		240		0	0	560	
03:30	13		25		0	0	38		15:30	316		299		0	0	615	
03:45	7	43	12	49	0	0	19	92	15:45	311	1346	260	1145	0	0	571	2491
04:00	15		15		0	0	30		16:00	365		268		0	0	633	
04:15	15		27		0	0	42		16:15	377		230		0	0	607	
04:30	38		45		0	0	83		16:30	379		289		0	0	668	
04:45	44	112	66	153	0	0	110	265	16:45	412	1533	307	1094	0	0	719	2627
05:00	32		70		0	0	102		17:00	420		286		0	0	706	
05:15	41		84		0	0	125		17:15	470		359		0	0	829	
05:30	61		100		0	0	161		17:30	451		269		0	0	720	
05:45	118	252	124	378	0	0	242	630	17:45	448	1789	248	1162	0	0	696	2951
06:00	80		152		0	0	232		18:00	383		225		0	0	608	
06:15	104		175		0	0	279		18:15	388		220		0	0	608	
06:30	141		250		0	0	391		18:30	342		241		0	0	583	
06:45	160	485	300	877	0	0	460	1362	18:45	306	1419	166	852	0	0	472	2271
07:00	159		317		0	0	476		19:00	245		157		0	0	402	
07:15	167		370		0	0	537		19:15	266		138		0	0	404	
07:30	222		374		0	0	596		19:30	243		123		0	0	366	
07:45	293	841	427	1488	0	0	720	2329	19:45	207	961	151	569	0	0	358	1530
08:00	340		396		0	0	736		20:00	229		111		0	0	340	
08:15	239		381		0	0	620		20:15	203		131		0	0	334	
08:30	215		380		0	0	595		20:30	205		104		0	0	309	
08:45	182	976	331	1488	0	0	513	2464	20:45	175	812	92	438	0	0	267	1250
09:00	171		248		0	0	419		21:00	170		87		0	0	257	
09:15	189		220		0	0	409		21:15	146		109		0	0	255	
09:30	156		226		0	0	382		21:30	163		64		0	0	227	
09:45	178	694	234	928	0	0	412	1622	21:45	130	609	79	339	0	0	209	948
10:00	166		195		0	0	361		22:00	111		92		0	0	203	
10:15	165		263		0	0	428		22:15	110		52		0	0	162	
10:30	161		221		0	0	382		22:30	76		47		0	0	123	
10:45	173	665	196	875	0	0	369	1540	22:45	77	374	40	231	0	0	117	605
11:00	151		192		0	0	343		23:00	56		49		0	0	105	
11:15	170		210		0	0	380		23:15	61		46		0	0	107	
11:30	238		236		0	0	474		23:30	59		32		0	0	91	
11:45	211	770	179	817	0	0	390	1587	23:45	19	195	23	150	0	0	42	345
TOTALS		5021		7133				**12154**	**TOTALS**		11969		8904				**20873**
SPLIT %		41.3%		58.7%				**36.8%**	**SPLIT %**		57.3%		42.7%				**63.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	16,990	16,037	0	0	33,027

AM Peak Hour	07:30	07:45			**07:30**	**PM Peak Hour**	17:00	16:30			**16:45**
AM Pk Volume	1094	1584			**2672**	**PM Pk Volume**	1789	1241			**2974**
Pk Hr Factor	0.804	0.927			**0.908**	**Pk Hr Factor**	0.952	0.864			**0.897**
7 - 9 Volume	1817	2976	0	0	**4793**	**4 - 6 Volume**	3322	2256	0	0	**5578**
7 - 9 Peak Hour	07:30	07:45			**07:30**	**4 - 6 Peak Hour**	17:00	16:30			**16:45**
7 - 9 Pk Volume	1094	1584	0	0	**2672**	**4 - 6 Pk Volume**	1789	1241	0	0	**2974**
Pk Hr Factor	0.804	0.927	0.000	0.000	**0.908**	**Pk Hr Factor**	0.952	0.864	0.000	0.000	**0.897**

Prepared by NDS/ATD

VOLUME

Lake Forest Dr N/O Muirlands Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_048

DAILY TOTALS	NB	SB	EB	WB	Total
	17,002	15,625	0	0	32,627

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	30		10						40		12:00	240		195						435	
00:15	33		23						56		12:15	222		230						452	
00:30	20		13						33		12:30	250		214						464	
00:45	19	102	12	58					31	160	12:45	218	930	249	888					467	1818
01:00	22		12						34		13:00	241		222						463	
01:15	14		6						20		13:15	235		234						469	
01:30	13		6						19		13:30	206		229						435	
01:45	13	62	9	33					22	95	13:45	279	961	183	868					462	1829
02:00	10		10						20		14:00	195		190						385	
02:15	14		5						19		14:15	240		223						463	
02:30	12		6						18		14:30	252		246						498	
02:45	15	51	9	30					24	81	14:45	260	947	254	913					514	1860
03:00	10		8						18		15:00	305		240						545	
03:15	16		15						31		15:15	314		277						591	
03:30	14		21						35		15:30	300		275						575	
03:45	15	55	15	59					30	114	15:45	301	1220	264	1056					565	2276
04:00	10		16						26		16:00	355		247						602	
04:15	16		30						46		16:15	391		262						653	
04:30	34		56						90		16:30	419		255						674	
04:45	50	110	52	154					102	264	16:45	424	1589	286	1050					710	2639
05:00	31		67						98		17:00	476		294						770	
05:15	44		78						122		17:15	477		301						778	
05:30	73		110						183		17:30	453		302						755	
05:45	134	282	152	407					286	689	17:45	432	1838	248	1145					680	2983
06:00	122		143						265		18:00	397		227						624	
06:15	244		198						442		18:15	392		238						630	
06:30	143		217						360		18:30	349		198						547	
06:45	171	680	277	835					448	1515	18:45	345	1483	190	853					535	2336
07:00	147		355						502		19:00	287		167						454	
07:15	195		378						573		19:15	255		117						372	
07:30	249		391						640		19:30	228		148						376	
07:45	286	877	368	1492					654	2369	19:45	232	1002	146	578					378	1580
08:00	284		371						655		20:00	190		102						292	
08:15	234		395						629		20:15	185		125						310	
08:30	172		371						543		20:30	187		99						286	
08:45	199	889	339	1476					538	2365	20:45	161	723	78	404					239	1127
09:00	153		238						391		21:00	165		62						227	
09:15	173		249						422		21:15	157		89						246	
09:30	170		226						396		21:30	139		70						209	
09:45	174	670	261	974					435	1644	21:45	122	583	48	269					170	852
10:00	162		221						383		22:00	113		54						167	
10:15	159		236						395		22:15	97		43						140	
10:30	165		219						384		22:30	74		47						121	
10:45	178	664	233	909					411	1573	22:45	63	347	44	188					107	535
11:00	177		196						373		23:00	48		29						77	
11:15	198		216						414		23:15	65		42						107	
11:30	182		241						423		23:30	34		22						56	
11:45	203	760	228	881					431	1641	23:45	30	177	12	105					42	282
TOTALS		5202		7308						12510	TOTALS		11800		8317						20117
SPLIT %		41.6%		58.4%						38.3%	SPLIT %		58.7%		41.3%						61.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	17,002	15,625	0	0	32,627

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	17:00	16:45			16:45
AM Pk Volume	1053	1525			2578	PM Pk Volume	1838	1183			3013
Pk Hr Factor	0.920	0.965			0.984	Pk Hr Factor	0.963	0.979			0.968
7 - 9 Volume	1766	2968	0	0	4734	4 - 6 Volume	3427	2195	0	0	5622
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	17:00	16:45			16:45
7 - 9 Pk Volume	1053	1525	0	0	2578	4 - 6 Pk Volume	1838	1183	0	0	3013
Pk Hr Factor	0.920	0.965	0.000	0.000	0.984	Pk Hr Factor	0.963	0.979	0.000	0.000	0.968

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Lake Forest Dr S/O Muirlands Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_049

DAILY TOTALS	NB	SB	EB	WB	Total
	18,281	17,730	0	0	36,011

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	26		12		0	0	38		12:00	240		232		0	0	472	
00:15	37		25		0	0	62		12:15	272		263		0	0	535	
00:30	25		13		0	0	38		12:30	247		253		0	0	500	
00:45	25	113	13	63	0	0	38	176	12:45	274	1033	298	1046	0	0	572	2079
01:00	26		19		0	0	45		13:00	209		309		0	0	518	
01:15	15		10		0	0	25		13:15	262		283		0	0	545	
01:30	12		7		0	0	19		13:30	265		265		0	0	530	
01:45	15	68	6	42	0	0	21	110	13:45	289	1025	243	1100	0	0	532	2125
02:00	9		11		0	0	20		14:00	211		233		0	0	444	
02:15	12		12		0	0	24		14:15	258		290		0	0	548	
02:30	8		9		0	0	17		14:30	280		258		0	0	538	
02:45	11	40	8	40	0	0	19	80	14:45	317	1066	260	1041	0	0	577	2107
03:00	7		8		0	0	15		15:00	309		264		0	0	573	
03:15	15		17		0	0	32		15:15	329		330		0	0	659	
03:30	14		30		0	0	44		15:30	320		308		0	0	628	
03:45	17	53	23	78	0	0	40	131	15:45	354	1312	309	1211	0	0	663	2523
04:00	13		17		0	0	30		16:00	386		288		0	0	674	
04:15	16		30		0	0	46		16:15	440		269		0	0	709	
04:30	37		52		0	0	89		16:30	435		321		0	0	756	
04:45	50	116	58	157	0	0	108	273	16:45	440	1701	306	1184	0	0	746	2885
05:00	33		64		0	0	97		17:00	515		340		0	0	855	
05:15	49		82		0	0	131		17:15	465		334		0	0	799	
05:30	77		113		0	0	190		17:30	487		300		0	0	787	
05:45	131	290	151	410	0	0	282	700	17:45	442	1909	305	1279	0	0	747	3188
06:00	174		135		0	0	309		18:00	392		263		0	0	655	
06:15	304		221		0	0	525		18:15	424		266		0	0	690	
06:30	157		225		0	0	382		18:30	370		224		0	0	594	
06:45	171	806	300	881	0	0	471	1687	18:45	349	1535	225	978	0	0	574	2513
07:00	167		389		0	0	556		19:00	323		182		0	0	505	
07:15	195		419		0	0	614		19:15	290		164		0	0	454	
07:30	241		407		0	0	648		19:30	223		188		0	0	411	
07:45	287	890	403	1618	0	0	690	2508	19:45	232	1068	182	716	0	0	414	1784
08:00	290		390		0	0	680		20:00	192		133		0	0	325	
08:15	237		418		0	0	655		20:15	209		159		0	0	368	
08:30	198		375		0	0	573		20:30	192		138		0	0	330	
08:45	207	932	366	1549	0	0	573	2481	20:45	174	767	103	533	0	0	277	1300
09:00	163		250		0	0	413		21:00	176		102		0	0	278	
09:15	194		271		0	0	465		21:15	159		88		0	0	247	
09:30	188		234		0	0	422		21:30	158		91		0	0	249	
09:45	173	718	280	1035	0	0	453	1753	21:45	130	623	74	355	0	0	204	978
10:00	174		272		0	0	446		22:00	119		78		0	0	197	
10:15	173		263		0	0	436		22:15	109		56		0	0	165	
10:30	195		261		0	0	456		22:30	81		55		0	0	136	
10:45	204	746	246	1042	0	0	450	1788	22:45	63	372	57	246	0	0	120	618
11:00	207		231		0	0	438		23:00	50		30		0	0	80	
11:15	220		242		0	0	462		23:15	74		43		0	0	117	
11:30	223		243		0	0	466		23:30	45		31		0	0	76	
11:45	238	888	275	991	0	0	513	1879	23:45	41	210	31	135	0	0	72	345
TOTALS		5660		7906				13566	TOTALS		12621		9824				22445
SPLIT %		41.7%		58.3%				37.7%	SPLIT %		56.2%		43.8%				62.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	18,281	17,730	0	0	36,011

AM Peak Hour	07:30	07:15			07:30	PM Peak Hour	17:00	16:30			17:00
AM Pk Volume	1055	1619			2673	PM Pk Volume	1909	1301			3188
Pk Hr Factor	0.909	0.966			0.968	Pk Hr Factor	0.927	0.957			0.932
7 - 9 Volume	1822	3167	0	0	4989	4 - 6 Volume	3610	2463	0	0	6073
7 - 9 Peak Hour	07:30	07:15			07:30	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	1055	1619	0	0	2673	4 - 6 Pk Volume	1909	1301	0	0	3188
Pk Hr Factor	0.909	0.966	0.000	0.000	0.968	Pk Hr Factor	0.927	0.957	0.000	0.000	0.932

Prepared by NDS/ATD

VOLUME

Lake Forest Dr S/O Rockfield Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_050

DAILY TOTALS	NB	SB	EB	WB	Total
	31,715	27,561	0	0	59,276

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	98		52						150		12:00	509		463						972	
00:15	86		45						131		12:15	574		434						1008	
00:30	63		40						103		12:30	527		452						979	
00:45	46	293	32	169					78	462	12:45	524	2134	493	1842					1017	3976
01:00	61		35						96		13:00	508		476						984	
01:15	52		50						102		13:15	527		470						997	
01:30	40		49						89		13:30	475		506						981	
01:45	37	190	27	161					64	351	13:45	480	1990	487	1939					967	3929
02:00	55		36						91		14:00	472		469						941	
02:15	53		17						70		14:15	463		444						907	
02:30	74		34						108		14:30	463		453						916	
02:45	89	271	31	118					120	389	14:45	501	1899	435	1801					936	3700
03:00	30		21						51		15:00	534		454						988	
03:15	49		29						78		15:15	512		432						944	
03:30	78		39						117		15:30	581		401						982	
03:45	87	244	31	120					118	364	15:45	566	2193	431	1718					997	3911
04:00	55		62						117		16:00	616		439						1055	
04:15	92		51						143		16:15	663		461						1124	
04:30	196		79						275		16:30	707		380						1087	
04:45	248	591	78	270					326	861	16:45	722	2708	421	1701					1143	4409
05:00	136		96						232		17:00	770		449						1219	
05:15	79		122						201		17:15	761		529						1290	
05:30	128		137						265		17:30	724		480						1204	
05:45	153	496	193	548					346	1044	17:45	729	2984	464	1922					1193	4906
06:00	170		235						405		18:00	639		434						1073	
06:15	196		273						469		18:15	637		421						1058	
06:30	242		341						583		18:30	520		366						886	
06:45	291	899	414	1263					705	2162	18:45	462	2258	315	1536					777	3794
07:00	291		398						689		19:00	458		348						806	
07:15	369		466						835		19:15	367		296						663	
07:30	404		524						928		19:30	326		233						559	
07:45	433	1497	522	1910					955	3407	19:45	351	1502	278	1155					629	2657
08:00	420		489						909		20:00	315		267						582	
08:15	419		477						896		20:15	309		254						563	
08:30	408		496						904		20:30	245		241						486	
08:45	489	1736	424	1886					913	3622	20:45	253	1122	186	948					439	2070
09:00	373		465						838		21:00	291		207						498	
09:15	374		403						777		21:15	277		241						518	
09:30	369		426						795		21:30	244		173						417	
09:45	405	1521	397	1691					802	3212	21:45	196	1008	168	789					364	1797
10:00	363		411						774		22:00	188		138						326	
10:15	364		361						725		22:15	172		127						299	
10:30	368		405						773		22:30	148		131						279	
10:45	382	1477	426	1603					808	3080	22:45	147	655	103	499					250	1154
11:00	347		388						735		23:00	134		92						226	
11:15	461		406						867		23:15	45		90						135	
11:30	476		437						913		23:30	52		68						120	
11:45	492	1776	433	1664					925	3440	23:45	40	271	58	308					98	579
TOTALS		10991		11403						22394	TOTALS		20724		16158						36882
SPLIT %		49.1%		50.9%						37.8%	SPLIT %		56.2%		43.8%						62.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	31,715	27,561	0	0	59,276

AM Peak Hour	11:45	07:30			11:45	PM Peak Hour	17:00	12:45			17:00
AM Pk Volume	2102	2012			3884	PM Pk Volume	2984	1945			4906
Pk Hr Factor	0.916	0.960			0.963	Pk Hr Factor	0.969	0.961			0.951
7 - 9 Volume	3233	3796	0	0	7029	4 - 6 Volume	5692	3623	0	0	9315
7 - 9 Peak Hour	08:00	07:30			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	1736	2012	0	0	3688	4 - 6 Pk Volume	2984	1922	0	0	4906
Pk Hr Factor	0.888	0.960	0.000	0.000	0.965	Pk Hr Factor	0.969	0.908	0.000	0.000	0.951

Prepared by NDS/ATD

VOLUME

Ridge Route Dr N/O Toledo Way

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_051

DAILY TOTALS	NB	SB	EB	WB	Total
	3,318	3,348	0	0	6,666

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	1		2						3		12:00	36		39						75	
00:15	3		0						3		12:15	43		69						112	
00:30	1		2						3		12:30	63		88						151	
00:45	4	9	1	5					5	14	12:45	45	187	47	243					92	430
01:00	1		0						1		13:00	39		30						69	
01:15	0		1						1		13:15	36		42						78	
01:30	2		0						2		13:30	37		49						86	
01:45	2	5	0	1					2	6	13:45	48	160	39	160					87	320
02:00	1		0						1		14:00	42		58						100	
02:15	2		1						3		14:15	64		81						145	
02:30	0		0						0		14:30	53		52						105	
02:45	0	3	1	2					1	5	14:45	55	214	123	314					178	528
03:00	1		0						1		15:00	123		113						236	
03:15	1		1						2		15:15	111		76						187	
03:30	2		1						3		15:30	70		58						128	
03:45	1	5	0	2					1	7	15:45	50	354	49	296					99	650
04:00	3		1						4		16:00	51		48						99	
04:15	3		0						3		16:15	61		46						107	
04:30	3		2						5		16:30	78		84						162	
04:45	2	11	6	9					8	20	16:45	83	273	65	243					148	516
05:00	3		3						6		17:00	93		72						165	
05:15	3		8						11		17:15	77		53						130	
05:30	3		3						6		17:30	115		73						188	
05:45	7	16	4	18					11	34	17:45	75	360	72	270					147	630
06:00	9		11						20		18:00	76		51						127	
06:15	8		15						23		18:15	69		47						116	
06:30	8		15						23		18:30	82		54						136	
06:45	12	37	30	71					42	108	18:45	73	300	52	204					125	504
07:00	21		40						61		19:00	57		58						115	
07:15	34		46						80		19:15	35		48						83	
07:30	70		72						142		19:30	47		20						67	
07:45	82	207	159	317					241	524	19:45	41	180	34	160					75	340
08:00	88		117						205		20:00	39		30						69	
08:15	83		139						222		20:15	28		28						56	
08:30	37		69						106		20:30	34		23						57	
08:45	36	244	33	358					69	602	20:45	31	132	21	102					52	234
09:00	27		36						63		21:00	32		26						58	
09:15	33		35						68		21:15	21		25						46	
09:30	32		35						67		21:30	25		17						42	
09:45	32	124	52	158					84	282	21:45	21	99	8	76					29	175
10:00	79		85						164		22:00	18		10						28	
10:15	61		45						106		22:15	13		7						20	
10:30	23		27						50		22:30	11		4						15	
10:45	24	187	22	179					46	366	22:45	8	50	2	23					10	73
11:00	31		25						56		23:00	9		4						13	
11:15	31		28						59		23:15	10		7						17	
11:30	36		29						65		23:30	6		2						8	
11:45	31	129	40	122					71	251	23:45	7	32	2	15					9	47
TOTALS		977		1242						2219	TOTALS		2341		2106						4447
SPLIT %		44.0%		56.0%						33.3%	SPLIT %		52.6%		47.4%						66.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,318	3,348	0	0	6,666

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	16:45	14:45			14:45
AM Pk Volume	323	487			810	PM Pk Volume	368	370			729
Pk Hr Factor	0.918	0.766			0.840	Pk Hr Factor	0.800	0.752			0.772
7 - 9 Volume	451	675	0	0	1126	4 - 6 Volume	633	513	0	0	1146
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:45	16:30			16:45
7 - 9 Pk Volume	323	487	0	0	810	4 - 6 Pk Volume	368	274	0	0	631
Pk Hr Factor	0.918	0.766	0.000	0.000	0.840	Pk Hr Factor	0.800	0.815	0.000	0.000	0.839

Prepared by NDS/ATD

VOLUME

Ridge Route Dr N/O Jeronimo Rd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_052

DAILY TOTALS	NB	SB	EB	WB	Total
	3,653	3,775	0	0	7,428

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	7		5						12		12:00	29		37						66	
00:15	5		2						7		12:15	40		39						79	
00:30	4		2						6		12:30	50		86						136	
00:45	3	19	3	12					6	31	12:45	54	173	71	233					125	406
01:00	1		0						1		13:00	52		34						86	
01:15	2		1						3		13:15	60		94						154	
01:30	1		2						3		13:30	53		66						119	
01:45	0	4	1	4					1	8	13:45	68	233	81	275					149	508
02:00	1		0						1		14:00	120		62						182	
02:15	0		1						1		14:15	81		101						182	
02:30	0		1						1		14:30	71		61						132	
02:45	2	3	2	4					4	7	14:45	74	346	70	294					144	640
03:00	0		0						0		15:00	72		103						175	
03:15	2		2						4		15:15	76		88						164	
03:30	1		1						2		15:30	74		66						140	
03:45	0	3	4	7					4	10	15:45	62	284	61	318					123	602
04:00	0		3						3		16:00	73		64						137	
04:15	0		2						2		16:15	77		47						124	
04:30	3		7						10		16:30	67		57						124	
04:45	2	5	9	21					11	26	16:45	85	302	39	207					124	509
05:00	4		5						9		17:00	77		47						124	
05:15	3		9						12		17:15	92		59						151	
05:30	2		9						11		17:30	74		51						125	
05:45	6	15	8	31					14	46	17:45	83	326	57	214					140	540
06:00	6		17						23		18:00	79		60						139	
06:15	8		33						41		18:15	56		48						104	
06:30	29		43						72		18:30	73		37						110	
06:45	68	111	102	195					170	306	18:45	73	281	48	193					121	474
07:00	71		103						174		19:00	50		45						95	
07:15	79		112						191		19:15	35		23						58	
07:30	160		105						265		19:30	42		38						80	
07:45	118	428	196	516					314	944	19:45	48	175	32	138					80	313
08:00	107		195						302		20:00	30		19						49	
08:15	97		124						221		20:15	36		24						60	
08:30	58		83						141		20:30	29		21						50	
08:45	34	296	55	457					89	753	20:45	31	126	19	83					50	209
09:00	31		46						77		21:00	28		32						60	
09:15	20		39						59		21:15	22		30						52	
09:30	20		36						56		21:30	17		14						31	
09:45	23	94	38	159					61	253	21:45	14	81	13	89					27	170
10:00	25		43						68		22:00	15		10						25	
10:15	23		27						50		22:15	12		8						20	
10:30	29		29						58		22:30	19		7						26	
10:45	32	109	39	138					71	247	22:45	11	57	3	28					14	85
11:00	36		31						67		23:00	6		5						11	
11:15	42		30						72		23:15	5		2						7	
11:30	32		34						66		23:30	14		3						17	
11:45	40	150	51	146					91	296	23:45	7	32	3	13					10	45
TOTALS		1237		1690						2927	TOTALS		2416		2085						4501
SPLIT %		42.3%		57.7%						39.4%	SPLIT %		53.7%		46.3%						60.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,653	3,775	0	0	7,428

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	14:00	14:15			13:45
AM Pk Volume	482	620			1102	PM Pk Volume	346	335			645
Pk Hr Factor	0.753	0.791			0.877	Pk Hr Factor	0.721	0.813			0.886
7 - 9 Volume	724	973	0	0	1697	4 - 6 Volume	628	421	0	0	1049
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	482	620	0	0	1102	4 - 6 Pk Volume	328	214	0	0	540
Pk Hr Factor	0.753	0.791	0.000	0.000	0.877	Pk Hr Factor	0.891	0.907	0.000	0.000	0.894

Prepared by NDS/ATD

VOLUME

Ridge Route Dr S/O Jeronimo Rd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_053

DAILY TOTALS	NB	SB	EB	WB	Total
	3,900	3,789	0	0	7,689

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	9		6						15		12:00	59		48						107	
00:15	3		1						4		12:15	55		46						101	
00:30	2		1						3		12:30	56		86						142	
00:45	1	15	2	10					3	25	12:45	72	242	65	245					137	487
01:00	1		1						2		13:00	81		45						126	
01:15	0		2						2		13:15	69		53						122	
01:30	2		2						4		13:30	52		41						93	
01:45	0	3	2	7					2	10	13:45	68	270	45	184					113	454
02:00	2		0						2		14:00	74		46						120	
02:15	0		1						1		14:15	70		98						168	
02:30	1		0						1		14:30	59		56						115	
02:45	0	3	1	2					1	5	14:45	82	285	78	278					160	563
03:00	0		0						0		15:00	96		149						245	
03:15	2		1						3		15:15	123		133						256	
03:30	1		1						2		15:30	91		78						169	
03:45	0	3	2	4					2	7	15:45	72	382	63	423					135	805
04:00	1		4						5		16:00	77		55						132	
04:15	0		1						1		16:15	85		57						142	
04:30	2		2						4		16:30	81		72						153	
04:45	0	3	6	13					6	16	16:45	75	318	65	249					140	567
05:00	2		7						9		17:00	74		76						150	
05:15	3		6						9		17:15	96		81						177	
05:30	2		7						9		17:30	82		54						136	
05:45	2	9	8	28					10	37	17:45	91	343	72	283					163	626
06:00	3		13						16		18:00	86		45						131	
06:15	8		13						21		18:15	70		59						129	
06:30	28		24						52		18:30	59		73						132	
06:45	77	116	58	108					135	224	18:45	65	280	49	226					114	506
07:00	42		91						133		19:00	72		45						117	
07:15	35		61						96		19:15	69		42						111	
07:30	82		66						148		19:30	50		40						90	
07:45	109	268	133	351					242	619	19:45	38	229	44	171					82	400
08:00	111		199						310		20:00	46		27						73	
08:15	108		141						249		20:15	43		31						74	
08:30	81		90						171		20:30	40		12						52	
08:45	51	351	70	500					121	851	20:45	29	158	17	87					46	245
09:00	39		32						71		21:00	31		22						53	
09:15	35		46						81		21:15	22		18						40	
09:30	29		35						64		21:30	19		11						30	
09:45	33	136	44	157					77	293	21:45	17	89	15	66					32	155
10:00	44		33						77		22:00	14		10						24	
10:15	39		37						76		22:15	14		8						22	
10:30	35		42						77		22:30	12		12						24	
10:45	35	153	43	155					78	308	22:45	11	51	14	44					25	95
11:00	40		41						81		23:00	9		5						14	
11:15	41		33						74		23:15	6		5						11	
11:30	33		52						85		23:30	10		4						14	
11:45	47	161	50	176					97	337	23:45	7	32	8	22					15	54
TOTALS		1221		1511						2732	TOTALS		2679		2278						4957
SPLIT %		44.7%		55.3%						35.5%	SPLIT %		54.0%		46.0%						64.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,900	3,789	0	0	7,689

AM Peak Hour	07:30	07:45			07:45	PM Peak Hour	14:45	14:45			14:45
AM Pk Volume	410	563			972	PM Pk Volume	392	438			830
Pk Hr Factor	0.923	0.707			0.784	Pk Hr Factor	0.797	0.735			0.811
7 - 9 Volume	619	851	0	0	1470	4 - 6 Volume	661	532	0	0	1193
7 - 9 Peak Hour	07:30	07:45			07:45	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	410	563	0	0	972	4 - 6 Pk Volume	343	294	0	0	626
Pk Hr Factor	0.923	0.707	0.000	0.000	0.784	Pk Hr Factor	0.893	0.907	0.000	0.000	0.884

Prepared by NDS/ATD

VOLUME

Ridge Route Dr N/O Muirlands Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_054

DAILY TOTALS	NB	SB	EB	WB	Total
	3,334	3,552	0	0	6,886

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	2		2						4		12:00	59		42						101	
00:15	11		0						11		12:15	39		68						107	
00:30	2		2						4		12:30	57		78						135	
00:45	1	16	3	7					4	23	12:45	34	189	39	227					73	416
01:00	1		3						4		13:00	45		55						100	
01:15	1		0						1		13:15	59		56						115	
01:30	0		2						2		13:30	44		50						94	
01:45	1	3	1	6					2	9	13:45	52	200	42	203					94	403
02:00	2		2						4		14:00	62		56						118	
02:15	0		3						3		14:15	74		75						149	
02:30	1		2						3		14:30	71		76						147	
02:45	0	3	0	7					0	10	14:45	85	292	56	263					141	555
03:00	1		0						1		15:00	83		119						202	
03:15	0		1						1		15:15	76		120						196	
03:30	0		2						2		15:30	45		71						116	
03:45	2	3	1	4					3	7	15:45	77	281	54	364					131	645
04:00	1		0						1		16:00	62		47						109	
04:15	0		0						0		16:15	73		63						136	
04:30	0		4						4		16:30	79		63						142	
04:45	3	4	3	7					6	11	16:45	94	308	67	240					161	548
05:00	1		8						9		17:00	78		65						143	
05:15	2		9						11		17:15	80		69						149	
05:30	3		11						14		17:30	95		59						154	
05:45	4	10	11	39					15	49	17:45	73	326	58	251					131	577
06:00	5		14						19		18:00	70		68						138	
06:15	9		27						36		18:15	57		46						103	
06:30	15		19						34		18:30	67		57						124	
06:45	23	52	39	99					62	151	18:45	43	237	45	216					88	453
07:00	27		49						76		19:00	52		54						106	
07:15	28		53						81		19:15	58		35						93	
07:30	40		65						105		19:30	56		34						90	
07:45	92	187	113	280					205	467	19:45	46	212	41	164					87	376
08:00	86		115						201		20:00	27		22						49	
08:15	46		89						135		20:15	33		38						71	
08:30	32		81						113		20:30	35		25						60	
08:45	37	201	65	350					102	551	20:45	30	125	18	103					48	228
09:00	35		50						85		21:00	22		26						48	
09:15	39		45						84		21:15	22		15						37	
09:30	37		42						79		21:30	29		14						43	
09:45	60	171	53	190					113	361	21:45	15	88	15	70					30	158
10:00	86		58						144		22:00	21		22						43	
10:15	43		71						114		22:15	6		14						20	
10:30	33		48						81		22:30	8		12						20	
10:45	29	191	41	218					70	409	22:45	11	46	7	55					18	101
11:00	26		28						54		23:00	6		7						13	
11:15	41		39						80		23:15	12		9						21	
11:30	33		43						76		23:30	8		4						12	
11:45	57	157	49	159					106	316	23:45	6	32	10	30					16	62
TOTALS		998		1366						2364	TOTALS		2336		2186						4522
SPLIT %		42.2%		57.8%						34.3%	SPLIT %		51.7%		48.3%						65.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,334	3,552	0	0	6,886

AM Peak Hour	07:30	07:45			07:45	PM Peak Hour	16:45	14:30			14:30
AM Pk Volume	264	398			654	PM Pk Volume	347	371			686
Pk Hr Factor	0.717	0.865			0.798	Pk Hr Factor	0.913	0.773			0.849
7 - 9 Volume	388	630	0	0	1018	4 - 6 Volume	634	491	0	0	1125
7 - 9 Peak Hour	07:30	07:45			07:45	4 - 6 Peak Hour	16:45	16:30			16:45
7 - 9 Pk Volume	264	398	0	0	654	4 - 6 Pk Volume	347	264	0	0	607
Pk Hr Factor	0.717	0.865	0.000	0.000	0.798	Pk Hr Factor	0.913	0.957	0.000	0.000	0.943

Prepared by NDS/ATD

VOLUME

Ridge Route Dr N/O Rockfield Blvd

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_055

DAILY TOTALS	NB	SB	EB	WB	Total
	3,590	3,221	0	0	6,811

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	7		2						9		12:00	43		52						95	
00:15	3		2						5		12:15	70		53						123	
00:30	5		2						7		12:30	63		64						127	
00:45	2	17	0	6					2	23	12:45	65	241	62	231					127	472
01:00	4		0						4		13:00	56		67						123	
01:15	2		1						3		13:15	60		48						108	
01:30	1		1						2		13:30	62		63						125	
01:45	0	7	1	3					1	10	13:45	71	249	47	225					118	474
02:00	2		0						2		14:00	70		62						132	
02:15	1		0						1		14:15	56		39						95	
02:30	1		3						4		14:30	56		55						111	
02:45	1	5	1	4					2	9	14:45	65	247	47	203					112	450
03:00	1		2						3		15:00	71		40						111	
03:15	4		1						5		15:15	78		64						142	
03:30	4		2						6		15:30	66		56						122	
03:45	3	12	2	7					5	19	15:45	75	290	49	209					124	499
04:00	5		2						7		16:00	82		61						143	
04:15	7		6						13		16:15	64		43						107	
04:30	4		7						11		16:30	76		47						123	
04:45	3	19	9	24					12	43	16:45	103	325	63	214					166	539
05:00	5		7						12		17:00	101		57						158	
05:15	2		7						9		17:15	94		63						157	
05:30	6		9						15		17:30	91		56						147	
05:45	8	21	21	44					29	65	17:45	89	375	46	222					135	597
06:00	13		22						35		18:00	81		53						134	
06:15	11		32						43		18:15	83		53						136	
06:30	19		44						63		18:30	65		36						101	
06:45	32	75	52	150					84	225	18:45	57	286	43	185					100	471
07:00	25		69						94		19:00	66		47						113	
07:15	30		51						81		19:15	61		45						106	
07:30	46		57						103		19:30	64		43						107	
07:45	50	151	100	277					150	428	19:45	60	251	47	182					107	433
08:00	39		78						117		20:00	53		35						88	
08:15	40		78						118		20:15	35		25						60	
08:30	33		61						94		20:30	43		24						67	
08:45	36	148	49	266					85	414	20:45	40	171	24	108					64	279
09:00	33		47						80		21:00	34		21						55	
09:15	42		49						91		21:15	25		21						46	
09:30	33		41						74		21:30	23		12						35	
09:45	40	148	50	187					90	335	21:45	29	111	10	64					39	175
10:00	42		45						87		22:00	26		13						39	
10:15	34		47						81		22:15	19		8						27	
10:30	45		54						99		22:30	22		6						28	
10:45	34	155	38	184					72	339	22:45	16	83	9	36					25	119
11:00	39		37						76		23:00	9		5						14	
11:15	42		45						87		23:15	8		5						13	
11:30	46		39						85		23:30	13		4						17	
11:45	38	165	50	171					88	336	23:45	8	38	5	19					13	57
TOTALS		923		1323						2246	TOTALS		2667		1898						4565
SPLIT %		41.1%		58.9%						33.0%	SPLIT %		58.4%		41.6%						67.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	3,590	3,221	0	0	6,811

AM Peak Hour	11:45	07:45			07:30	PM Peak Hour	16:45	12:15			16:45
AM Pk Volume	214	317			488	PM Pk Volume	389	246			628
Pk Hr Factor	0.764	0.793			0.813	Pk Hr Factor	0.944	0.918			0.946
7 - 9 Volume	299	543	0	0	842	4 - 6 Volume	700	436	0	0	1136
7 - 9 Peak Hour	07:30	07:45			07:30	4 - 6 Peak Hour	16:45	16:45			16:45
7 - 9 Pk Volume	175	317	0	0	488	4 - 6 Pk Volume	389	239	0	0	628
Pk Hr Factor	0.875	0.793	0.000	0.000	0.813	Pk Hr Factor	0.944	0.948	0.000	0.000	0.946

Prepared by NDS/ATD

VOLUME

Ridge Route Dr S/O Rockfield Blvd

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_056

DAILY TOTALS	NB	SB	EB	WB	Total
	1,298	1,226	0	0	2,524

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	5		6						11		12:00	16		12						28	
00:15	3		3						6		12:15	18		17						35	
00:30	2		4						6		12:30	19		16						35	
00:45	0	10	3	16					3	26	12:45	12	65	25	70					37	135
01:00	0		2						2		13:00	21		18						39	
01:15	0		1						1		13:15	18		14						32	
01:30	0		1						1		13:30	21		29						50	
01:45	2	2	2	6					4	8	13:45	24	84	18	79					42	163
02:00	0		1						1		14:00	17		18						35	
02:15	0		0						0		14:15	17		17						34	
02:30	2		2						4		14:30	11		17						28	
02:45	2	4	2	5					4	9	14:45	16	61	19	71					35	132
03:00	0		2						2		15:00	16		21						37	
03:15	1		0						1		15:15	22		21						43	
03:30	0		0						0		15:30	13		19						32	
03:45	2	3	0	2					2	5	15:45	20	71	27	88					47	159
04:00	2		2						4		16:00	14		23						37	
04:15	6		0						6		16:15	27		29						56	
04:30	6		1						7		16:30	22		15						37	
04:45	11	25	2	5					13	30	16:45	18	81	30	97					48	178
05:00	10		2						12		17:00	20		31						51	
05:15	9		1						10		17:15	26		27						53	
05:30	13		3						16		17:30	20		33						53	
05:45	14	46	3	9					17	55	17:45	19	85	27	118					46	203
06:00	12		4						16		18:00	18		24						42	
06:15	23		4						27		18:15	24		23						47	
06:30	22		4						26		18:30	13		20						33	
06:45	29	86	6	18					35	104	18:45	14	69	23	90					37	159
07:00	31		13						44		19:00	21		27						48	
07:15	27		16						43		19:15	12		19						31	
07:30	44		10						54		19:30	23		23						46	
07:45	42	144	15	54					57	198	19:45	10	66	15	84					25	150
08:00	30		18						48		20:00	11		19						30	
08:15	26		16						42		20:15	10		20						30	
08:30	28		16						44		20:30	10		19						29	
08:45	21	105	10	60					31	165	20:45	14	45	18	76					32	121
09:00	12		9						21		21:00	8		14						22	
09:15	13		7						20		21:15	5		19						24	
09:30	20		10						30		21:30	7		16						23	
09:45	20	65	10	36					30	101	21:45	8	28	10	59					18	87
10:00	16		19						35		22:00	7		13						20	
10:15	14		14						28		22:15	6		16						22	
10:30	20		12						32		22:30	8		10						18	
10:45	11	61	12	57					23	118	22:45	3	24	7	46					10	70
11:00	10		11						21		23:00	3		6						9	
11:15	13		12						25		23:15	5		9						14	
11:30	16		15						31		23:30	2		7						9	
11:45	16	55	16	54					32	109	23:45	3	13	4	26					7	39
TOTALS		606		322						928	TOTALS		692		904						1596
SPLIT %		65.3%		34.7%						36.8%	SPLIT %		43.4%		56.6%						63.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,298	1,226	0	0	2,524

AM Peak Hour	07:00	07:45			07:15	PM Peak Hour	16:15	16:45			16:45
AM Pk Volume	144	65			202	PM Pk Volume	87	121			205
Pk Hr Factor	0.818	0.903			0.886	Pk Hr Factor	0.806	0.917			0.967
7 - 9 Volume	249	114	0	0	363	4 - 6 Volume	166	215	0	0	381
7 - 9 Peak Hour	07:00	07:45			07:15	4 - 6 Peak Hour	16:15	16:45			16:45
7 - 9 Pk Volume	144	65	0	0	202	4 - 6 Pk Volume	87	121	0	0	205
Pk Hr Factor	0.818	0.903	0.000	0.000	0.886	Pk Hr Factor	0.806	0.917	0.000	0.000	0.967

Prepared by NDS/ATD

VOLUME

El Toro Rd N/O Glenn Ranch Rd

Day: Thursday
Date: 4/12/2018

City: Lake Forest
Project #: CA18_1076_057

DAILY TOTALS	NB	SB	EB	WB	Total
	7,411	6,558	0	0	13,969

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	18		4						22		12:00	70		85						155	
00:15	7		7						14		12:15	96		79						175	
00:30	15		2						17		12:30	78		73						151	
00:45	13	53	8	21					21	74	12:45	92	336	79	316					171	652
01:00	7		3						10		13:00	71		85						156	
01:15	3		3						6		13:15	91		77						168	
01:30	4		5						9		13:30	115		74						189	
01:45	9	23	2	13					11	36	13:45	106	383	100	336					206	719
02:00	2		3						5		14:00	96		77						173	
02:15	4		2						6		14:15	115		75						190	
02:30	10		16						26		14:30	132		90						222	
02:45	2	18	2	23					4	41	14:45	157	500	90	332					247	832
03:00	2		2						4		15:00	143		100						243	
03:15	2		7						9		15:15	185		86						271	
03:30	2		11						13		15:30	186		91						277	
03:45	0	6	5	25					5	31	15:45	210	724	108	385					318	1109
04:00	2		7						9		16:00	202		82						284	
04:15	2		12						14		16:15	203		88						291	
04:30	2		18						20		16:30	207		112						319	
04:45	3	9	25	62					28	71	16:45	195	807	105	387					300	1194
05:00	5		24						29		17:00	223		101						324	
05:15	10		29						39		17:15	270		105						375	
05:30	21		36						57		17:30	207		117						324	
05:45	18	54	60	149					78	203	17:45	199	899	116	439					315	1338
06:00	33		46						79		18:00	208		128						336	
06:15	42		72						114		18:15	178		86						264	
06:30	60		130						190		18:30	140		80						220	
06:45	84	219	174	422					258	641	18:45	110	636	81	375					191	1011
07:00	92		143						235		19:00	114		76						190	
07:15	95		216						311		19:15	104		72						176	
07:30	89		257						346		19:30	106		60						166	
07:45	108	384	272	888					380	1272	19:45	97	421	65	273					162	694
08:00	118		189						307		20:00	96		43						139	
08:15	121		147						268		20:15	84		34						118	
08:30	96		158						254		20:30	85		48						133	
08:45	88	423	138	632					226	1055	20:45	60	325	42	167					102	492
09:00	67		114						181		21:00	54		38						92	
09:15	59		110						169		21:15	60		47						107	
09:30	41		110						151		21:30	58		32						90	
09:45	65	232	99	433					164	665	21:45	47	219	20	137					67	356
10:00	61		79						140		22:00	45		22						67	
10:15	63		78						141		22:15	38		18						56	
10:30	56		78						134		22:30	28		24						52	
10:45	75	255	74	309					149	564	22:45	26	137	17	81					43	218
11:00	64		69						133		23:00	16		12						28	
11:15	71		76						147		23:15	17		7						24	
11:30	69		79						148		23:30	17		14						31	
11:45	77	281	86	310					163	591	23:45	17	67	10	43					27	110
TOTALS		1957		3287						5244	TOTALS		5454		3271						8725
SPLIT %		37.3%		62.7%						37.5%	SPLIT %		62.5%		37.5%						62.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	7,411	6,558	0	0	13,969

AM Peak Hour	07:45	07:15			07:15	PM Peak Hour	17:00	17:15			17:15
AM Pk Volume	443	934			1344	PM Pk Volume	899	466			1350
Pk Hr Factor	0.915	0.858			0.884	Pk Hr Factor	0.832	0.910			0.900
7 - 9 Volume	807	1520	0	0	2327	4 - 6 Volume	1706	826	0	0	2532
7 - 9 Peak Hour	07:45	07:15			07:15	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	443	934	0	0	1344	4 - 6 Pk Volume	899	439	0	0	1338
Pk Hr Factor	0.915	0.858	0.000	0.000	0.884	Pk Hr Factor	0.832	0.938	0.000	0.000	0.892

Prepared by NDS/ATD

VOLUME

El Toro Rd S/O Glenn Ranch Rd

Day: Thursday
Date: 4/12/2018

City: Lake Forest
Project #: CA18_1076_058

DAILY TOTALS	NB	SB	EB	WB	Total
	7,894	6,906	0	0	14,800

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	20		5						25		12:00	94		89						183	
00:15	8		9						17		12:15	113		74						187	
00:30	14		3						17		12:30	113		89						202	
00:45	13	55	6	23					19	78	12:45	116	436	109	361					225	797
01:00	9		3						12		13:00	81		80						161	
01:15	3		3						6		13:15	90		70						160	
01:30	5		5						10		13:30	120		85						205	
01:45	10	27	3	14					13	41	13:45	122	413	114	349					236	762
02:00	2		1						3		14:00	103		82						185	
02:15	5		0						5		14:15	144		79						223	
02:30	2		3						5		14:30	129		102						231	
02:45	3	12	2	6					5	18	14:45	143	519	98	361					241	880
03:00	2		3						5		15:00	166		122						288	
03:15	2		3						5		15:15	206		89						295	
03:30	3		11						14		15:30	171		104						275	
03:45	1	8	2	19					3	27	15:45	202	745	117	432					319	1177
04:00	2		5						7		16:00	205		86						291	
04:15	4		11						15		16:15	209		104						313	
04:30	3		13						16		16:30	194		125						319	
04:45	6	15	19	48					25	63	16:45	201	809	123	438					324	1247
05:00	7		20						27		17:00	220		128						348	
05:15	11		22						33		17:15	258		131						389	
05:30	19		34						53		17:30	197		145						342	
05:45	20	57	56	132					76	189	17:45	197	872	148	552					345	1424
06:00	34		45						79		18:00	187		145						332	
06:15	50		56						106		18:15	155		103						258	
06:30	70		116						186		18:30	127		98						225	
06:45	95	249	173	390					268	639	18:45	109	578	91	437					200	1015
07:00	103		128						231		19:00	117		88						205	
07:15	123		208						331		19:15	100		75						175	
07:30	130		277						407		19:30	106		61						167	
07:45	187	543	295	908					482	1451	19:45	112	435	73	297					185	732
08:00	156		191						347		20:00	82		57						139	
08:15	136		123						259		20:15	88		54						142	
08:30	107		148						255		20:30	76		52						128	
08:45	106	505	119	581					225	1086	20:45	64	310	48	211					112	521
09:00	66		115						181		21:00	56		46						102	
09:15	66		103						169		21:15	64		56						120	
09:30	47		115						162		21:30	53		42						95	
09:45	73	252	97	430					170	682	21:45	46	219	26	170					72	389
10:00	64		82						146		22:00	52		23						75	
10:15	80		80						160		22:15	42		23						65	
10:30	66		70						136		22:30	30		27						57	
10:45	78	288	79	311					157	599	22:45	23	147	18	91					41	238
11:00	69		70						139		23:00	14		10						24	
11:15	82		78						160		23:15	13		13						26	
11:30	82		74						156		23:30	13		16						29	
11:45	113	346	76	298					189	644	23:45	14	54	8	47					22	101
TOTALS		2357		3160						5517	TOTALS		5537		3746						9283
SPLIT %		42.7%		57.3%						37.3%	SPLIT %		59.6%		40.4%						62.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	7,894	6,906	0	0	14,800

AM Peak Hour	07:30	07:15			07:15	PM Peak Hour	16:45	17:15			17:00
AM Pk Volume	609	971			1567	PM Pk Volume	876	569			1424
Pk Hr Factor	0.814	0.823			0.813	Pk Hr Factor	0.849	0.961			0.915
7 - 9 Volume	1048	1489	0	0	2537	4 - 6 Volume	1681	990	0	0	2671
7 - 9 Peak Hour	07:30	07:15			07:15	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	609	971	0	0	1567	4 - 6 Pk Volume	876	552	0	0	1424
Pk Hr Factor	0.814	0.823	0.000	0.000	0.813	Pk Hr Factor	0.849	0.932	0.000	0.000	0.915

Prepared by NDS/ATD

VOLUME

El Toro Rd N/O Santa Margarita Pkwy

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_059

DAILY TOTALS	NB	SB	EB	WB	Total
	6,435	7,397	0	0	13,832

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	14		10						24		12:00	69		100						169	
00:15	7		7						14		12:15	65		103						168	
00:30	9		5						14		12:30	92		84						176	
00:45	7	37	7	29					14	66	12:45	91	317	76	363					167	680
01:00	8		3						11		13:00	81		80						161	
01:15	3		1						4		13:15	58		71						129	
01:30	4		4						8		13:30	77		86						163	
01:45	5	20	2	10					7	30	13:45	72	288	67	304					139	592
02:00	4		8						12		14:00	94		86						180	
02:15	3		2						5		14:15	107		71						178	
02:30	2		4						6		14:30	101		110						211	
02:45	2	11	4	18					6	29	14:45	99	401	115	382					214	783
03:00	5		3						8		15:00	101		87						188	
03:15	5		7						12		15:15	159		87						246	
03:30	2		9						11		15:30	105		87						192	
03:45	4	16	6	25					10	41	15:45	118	483	90	351					208	834
04:00	3		11						14		16:00	124		92						216	
04:15	3		17						20		16:15	136		92						228	
04:30	4		25						29		16:30	178		104						282	
04:45	3	13	33	86					36	99	16:45	163	601	115	403					278	1004
05:00	5		31						36		17:00	163		91						254	
05:15	14		48						62		17:15	207		111						318	
05:30	22		77						99		17:30	197		88						285	
05:45	20	61	73	229					93	290	17:45	214	781	108	398					322	1179
06:00	17		86						103		18:00	185		103						288	
06:15	35		111						146		18:15	160		89						249	
06:30	39		163						202		18:30	139		102						241	
06:45	66	157	207	567					273	724	18:45	142	626	110	404					252	1030
07:00	66		201						267		19:00	120		76						196	
07:15	39		234						273		19:15	106		64						170	
07:30	66		311						377		19:30	109		81						190	
07:45	91	262	320	1066					411	1328	19:45	96	431	55	276					151	707
08:00	65		238						303		20:00	88		66						154	
08:15	95		224						319		20:15	88		57						145	
08:30	58		175						233		20:30	80		48						128	
08:45	66	284	158	795					224	1079	20:45	95	351	57	228					152	579
09:00	47		136						183		21:00	81		53						134	
09:15	54		111						165		21:15	79		47						126	
09:30	44		108						152		21:30	74		34						108	
09:45	57	202	124	479					181	681	21:45	57	291	27	161					84	452
10:00	70		114						184		22:00	42		25						67	
10:15	71		100						171		22:15	46		21						67	
10:30	58		90						148		22:30	40		14						54	
10:45	63	262	82	386					145	648	22:45	37	165	22	82					59	247
11:00	52		70						122		23:00	45		12						57	
11:15	91		83						174		23:15	26		9						35	
11:30	65		78						143		23:30	11		8						19	
11:45	72	280	80	311					152	591	23:45	13	95	15	44					28	139
TOTALS		1605		4001						5606	TOTALS		4830		3396						8226
SPLIT %		28.6%		71.4%						40.5%	SPLIT %		58.7%		41.3%						59.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	6,435	7,397	0	0	13,832

AM Peak Hour	07:30	07:15			07:30	PM Peak Hour	17:15	16:30			17:15
AM Pk Volume	317	1103			1410	PM Pk Volume	803	421			1213
Pk Hr Factor	0.834	0.862			0.858	Pk Hr Factor	0.938	0.915			0.942
7 - 9 Volume	546	1861	0	0	2407	4 - 6 Volume	1382	801	0	0	2183
7 - 9 Peak Hour	07:30	07:15			07:30	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	317	1103	0	0	1410	4 - 6 Pk Volume	781	421	0	0	1179
Pk Hr Factor	0.834	0.862	0.000	0.000	0.858	Pk Hr Factor	0.912	0.915	0.000	0.000	0.915

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

El Toro Rd S/O Santa Margarita Pkwy

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_060

DAILY TOTALS	NB	SB	EB	WB	Total
	12,649	12,673	0	0	25,322

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	14		17		0	0	31		12:00	149		194		0	0	343	
00:15	16		15		0	0	31		12:15	137		166		0	0	303	
00:30	14		16		0	0	30		12:30	187		174		0	0	361	
00:45	13	57	8	56	0	0	21	113	12:45	187	660	154	688	0	0	341	1348
01:00	11		15		0	0	26		13:00	161		164		0	0	325	
01:15	8		6		0	0	14		13:15	167		169		0	0	336	
01:30	14		4		0	0	18		13:30	155		160		0	0	315	
01:45	12	45	6	31	0	0	18	76	13:45	195	678	136	629	0	0	331	1307
02:00	6		6		0	0	12		14:00	207		169		0	0	376	
02:15	5		2		0	0	7		14:15	180		198		0	0	378	
02:30	5		6		0	0	11		14:30	205		223		0	0	428	
02:45	6	22	4	18	0	0	10	40	14:45	192	784	229	819	0	0	421	1603
03:00	6		4		0	0	10		15:00	197		216		0	0	413	
03:15	6		4		0	0	10		15:15	248		199		0	0	447	
03:30	11		11		0	0	22		15:30	224		215		0	0	439	
03:45	13	36	13	32	0	0	26	68	15:45	223	892	228	858	0	0	451	1750
04:00	10		21		0	0	31		16:00	249		222		0	0	471	
04:15	20		20		0	0	40		16:15	254		230		0	0	484	
04:30	35		34		0	0	69		16:30	261		252		0	0	513	
04:45	37	102	47	122	0	0	84	224	16:45	300	1064	255	959	0	0	555	2023
05:00	23		38		0	0	61		17:00	286		232		0	0	518	
05:15	42		56		0	0	98		17:15	337		288		0	0	625	
05:30	56		60		0	0	116		17:30	315		243		0	0	558	
05:45	79	200	88	242	0	0	167	442	17:45	335	1273	224	987	0	0	559	2260
06:00	65		98		0	0	163		18:00	284		194		0	0	478	
06:15	82		118		0	0	200		18:15	273		224		0	0	497	
06:30	126		181		0	0	307		18:30	225		223		0	0	448	
06:45	166	439	188	585	0	0	354	1024	18:45	262	1044	168	809	0	0	430	1853
07:00	150		213		0	0	363		19:00	195		157		0	0	352	
07:15	189		224		0	0	413		19:15	188		160		0	0	348	
07:30	217		315		0	0	532		19:30	164		159		0	0	323	
07:45	291	847	292	1044	0	0	583	1891	19:45	186	733	152	628	0	0	338	1361
08:00	226		307		0	0	533		20:00	150		136		0	0	286	
08:15	204		246		0	0	450		20:15	127		122		0	0	249	
08:30	184		242		0	0	426		20:30	157		111		0	0	268	
08:45	188	802	175	970	0	0	363	1772	20:45	151	585	113	482	0	0	264	1067
09:00	157		185		0	0	342		21:00	111		109		0	0	220	
09:15	126		197		0	0	323		21:15	120		118		0	0	238	
09:30	130		185		0	0	315		21:30	96		107		0	0	203	
09:45	136	549	197	764	0	0	333	1313	21:45	87	414	67	401	0	0	154	815
10:00	122		178		0	0	300		22:00	69		65		0	0	134	
10:15	149		161		0	0	310		22:15	66		45		0	0	111	
10:30	117		146		0	0	263		22:30	58		35		0	0	93	
10:45	123	511	154	639	0	0	277	1150	22:45	50	243	35	180	0	0	85	423
11:00	98		144		0	0	242		23:00	45		43		0	0	88	
11:15	174		149		0	0	323		23:15	33		25		0	0	58	
11:30	137		161		0	0	298		23:30	24		22		0	0	46	
11:45	136	545	165	619	0	0	301	1164	23:45	22	124	21	111	0	0	43	235
TOTALS		4155		5122				9277	TOTALS		8494		7551				16045
SPLIT %		44.8%		55.2%				36.6%	SPLIT %		52.9%		47.1%				63.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	12,649	12,673	0	0	25,322

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	17:00	16:30			17:00
AM Pk Volume	938	1160			2098	PM Pk Volume	1273	1027			2260
Pk Hr Factor	0.806	0.921			0.900	Pk Hr Factor	0.944	0.891			0.904
7 - 9 Volume	1649	2014	0	0	3663	4 - 6 Volume	2337	1946	0	0	4283
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	938	1160	0	0	2098	4 - 6 Pk Volume	1273	1027	0	0	2260
Pk Hr Factor	0.806	0.921	0.000	0.000	0.900	Pk Hr Factor	0.944	0.891	0.000	0.000	0.904

Prepared by NDS/ATD

VOLUME

El Toro Rd N/O Trabuco Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_061

DAILY TOTALS	NB	SB	EB	WB	Total
	16,669	14,689	0	0	31,358

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	22		15						37		12:00	205		195						400	
00:15	33		14						47		12:15	189		208						397	
00:30	23		8						31		12:30	264		195						459	
00:45	15	93	10	47					25	140	12:45	220	878	214	812					434	1690
01:00	13		12						25		13:00	216		196						412	
01:15	17		8						25		13:15	211		190						401	
01:30	13		4						17		13:30	226		174						400	
01:45	11	54	5	29					16	83	13:45	242	895	170	730					412	1625
02:00	8		9						17		14:00	236		206						442	
02:15	7		6						13		14:15	290		227						517	
02:30	4		4						8		14:30	251		247						498	
02:45	5	24	10	29					15	53	14:45	266	1043	319	999					585	2042
03:00	7		12						19		15:00	309		246						555	
03:15	11		13						24		15:15	394		210						604	
03:30	16		13						29		15:30	306		216						522	
03:45	14	48	17	55					31	103	15:45	312	1321	220	892					532	2213
04:00	12		25						37		16:00	336		206						542	
04:15	13		32						45		16:15	326		262						588	
04:30	31		47						78		16:30	358		255						613	
04:45	34	90	58	162					92	252	16:45	380	1400	266	989					646	2389
05:00	27		65						92		17:00	411		233						644	
05:15	39		67						106		17:15	419		277						696	
05:30	47		92						139		17:30	453		224						677	
05:45	68	181	108	332					176	513	17:45	423	1706	235	969					658	2675
06:00	55		148						203		18:00	383		183						566	
06:15	80		158						238		18:15	368		204						572	
06:30	100		227						327		18:30	324		201						525	
06:45	153	388	249	782					402	1170	18:45	304	1379	199	787					503	2166
07:00	161		291						452		19:00	267		182						449	
07:15	198		345						543		19:15	313		161						474	
07:30	204		409						613		19:30	260		139						399	
07:45	286	849	448	1493					734	2342	19:45	254	1094	144	626					398	1720
08:00	256		351						607		20:00	255		124						379	
08:15	237		344						581		20:15	220		120						340	
08:30	239		311						550		20:30	223		95						318	
08:45	180	912	260	1266					440	2178	20:45	229	927	109	448					338	1375
09:00	177		237						414		21:00	195		92						287	
09:15	160		251						411		21:15	181		95						276	
09:30	138		260						398		21:30	171		90						261	
09:45	174	649	247	995					421	1644	21:45	151	698	57	334					208	1032
10:00	183		270						453		22:00	95		68						163	
10:15	169		206						375		22:15	102		49						151	
10:30	160		176						336		22:30	97		38						135	
10:45	169	681	210	862					379	1543	22:45	72	366	38	193					110	559
11:00	157		170						327		23:00	74		40						114	
11:15	222		211						433		23:15	58		21						79	
11:30	189		187						376		23:30	37		23						60	
11:45	214	782	189	757					403	1539	23:45	42	211	17	101					59	312
TOTALS		4751		6809						11560	TOTALS		11918		7880						19798
SPLIT %		41.1%		58.9%						36.9%	SPLIT %		60.2%		39.8%						63.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	16,669	14,689	0	0	31,358

AM Peak Hour	07:45	07:15			07:30	PM Peak Hour	17:00	14:15			17:00
AM Pk Volume	1018	1553			2535	PM Pk Volume	1706	1039			2675
Pk Hr Factor	0.890	0.867			0.863	Pk Hr Factor	0.942	0.814			0.961
7 - 9 Volume	1761	2759	0	0	4520	4 - 6 Volume	3106	1958	0	0	5064
7 - 9 Peak Hour	07:45	07:15			07:30	4 - 6 Peak Hour	17:00	16:30			17:00
7 - 9 Pk Volume	1018	1553	0	0	2535	4 - 6 Pk Volume	1706	1031	0	0	2675
Pk Hr Factor	0.890	0.867	0.000	0.000	0.863	Pk Hr Factor	0.942	0.931	0.000	0.000	0.961

Prepared by NDS/ATD

VOLUME

El Toro Rd S/O Trabuco Rd

Day: Tuesday
Date: 4/17/2018

City: Lake Forest
Project #: CA18_1076_062

DAILY TOTALS	NB	SB	EB	WB	Total
	17,623	18,161	0	0	35,784

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	29		22						51		12:00	222		250						472	
00:15	33		14						47		12:15	220		263						483	
00:30	30		15						45		12:30	274		243						517	
00:45	18	110	15	66					33	176	12:45	234	950	277	1033					511	1983
01:00	19		12						31		13:00	258		257						515	
01:15	18		13						31		13:15	256		263						519	
01:30	15		11						26		13:30	251		236						487	
01:45	14	66	13	49					27	115	13:45	251	1016	232	988					483	2004
02:00	12		14						26		14:00	283		254						537	
02:15	8		7						15		14:15	312		279						591	
02:30	7		10						17		14:30	296		300						596	
02:45	6	33	15	46					21	79	14:45	278	1169	351	1184					629	2353
03:00	10		12						22		15:00	332		293						625	
03:15	15		11						26		15:15	407		268						675	
03:30	16		12						28		15:30	336		278						614	
03:45	17	58	17	52					34	110	15:45	333	1408	276	1115					609	2523
04:00	16		34						50		16:00	356		259						615	
04:15	12		35						47		16:15	347		295						642	
04:30	26		61						87		16:30	376		309						685	
04:45	39	93	78	208					117	301	16:45	414	1493	370	1233					784	2726
05:00	27		81						108		17:00	434		302						736	
05:15	45		84						129		17:15	448		306						754	
05:30	47		129						176		17:30	454		292						746	
05:45	72	191	125	419					197	610	17:45	441	1777	276	1176					717	2953
06:00	56		166						222		18:00	373		228						601	
06:15	91		181						272		18:15	389		273						662	
06:30	113		240						353		18:30	335		246						581	
06:45	155	415	299	886					454	1301	18:45	333	1430	244	991					577	2421
07:00	175		321						496		19:00	264		208						472	
07:15	185		390						575		19:15	302		205						507	
07:30	211		503						714		19:30	262		183						445	
07:45	289	860	521	1735					810	2595	19:45	230	1058	181	777					411	1835
08:00	265		466						731		20:00	271		151						422	
08:15	228		376						604		20:15	204		140						344	
08:30	212		366						578		20:30	216		122						338	
08:45	208	913	328	1536					536	2449	20:45	251	942	118	531					369	1473
09:00	186		294						480		21:00	193		129						322	
09:15	154		306						460		21:15	193		114						307	
09:30	169		288						457		21:30	158		127						285	
09:45	185	694	316	1204					501	1898	21:45	151	695	83	453					234	1148
10:00	192		352						544		22:00	117		75						192	
10:15	206		258						464		22:15	117		74						191	
10:30	161		216						377		22:30	90		56						146	
10:45	177	736	273	1099					450	1835	22:45	75	399	35	240					110	639
11:00	186		212						398		23:00	87		63						150	
11:15	224		279						503		23:15	74		33						107	
11:30	243		251						494		23:30	41		32						73	
11:45	214	867	245	987					459	1854	23:45	48	250	25	153					73	403
TOTALS		5036		8287						13323	TOTALS		12587		9874						22461
SPLIT %		37.8%		62.2%						37.2%	SPLIT %		56.0%		44.0%						62.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	17,623	18,161	0	0	35,784

AM Peak Hour	07:45	07:15			07:30	PM Peak Hour	17:00	16:30			16:45
AM Pk Volume	994	1880			2859	PM Pk Volume	1777	1287			3020
Pk Hr Factor	0.860	0.902			0.882	Pk Hr Factor	0.979	0.870			0.963
7 - 9 Volume	1773	3271	0	0	5044	4 - 6 Volume	3270	2409	0	0	5679
7 - 9 Peak Hour	07:45	07:15			07:30	4 - 6 Peak Hour	17:00	16:30			16:45
7 - 9 Pk Volume	994	1880	0	0	2859	4 - 6 Pk Volume	1777	1287	0	0	3020
Pk Hr Factor	0.860	0.902	0.000	0.000	0.882	Pk Hr Factor	0.979	0.870	0.000	0.000	0.963

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

El Toro Rd N/O Jeronimo Rd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_063

DAILY TOTALS	NB	SB	EB	WB	Total
	19,528	19,011	0	0	38,539

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	37		22		0	0	59		12:00	294		248		0	0	542	
00:15	29		33		0	0	62		12:15	291		248		0	0	539	
00:30	27		19		0	0	46		12:30	291		265		0	0	556	
00:45	26	119	18	92	0	0	44	211	12:45	296	1172	265	1026	0	0	561	2198
01:00	29		44		0	0	73		13:00	281		285		0	0	566	
01:15	12		28		0	0	40		13:15	260		287		0	0	547	
01:30	14		10		0	0	24		13:30	296		246		0	0	542	
01:45	12	67	13	95	0	0	25	162	13:45	331	1168	279	1097	0	0	610	2265
02:00	16		3		0	0	19		14:00	305		258		0	0	563	
02:15	7		4		0	0	11		14:15	319		284		0	0	603	
02:30	10		6		0	0	16		14:30	358		303		0	0	661	
02:45	11	44	28	41	0	0	39	85	14:45	377	1359	307	1152	0	0	684	2511
03:00	13		14		0	0	27		15:00	461		331		0	0	792	
03:15	11		13		0	0	24		15:15	436		347		0	0	783	
03:30	24		16		0	0	40		15:30	404		321		0	0	725	
03:45	10	58	28	71	0	0	38	129	15:45	375	1676	300	1299	0	0	675	2975
04:00	10		30		0	0	40		16:00	396		225		0	0	621	
04:15	18		40		0	0	58		16:15	379		310		0	0	689	
04:30	24		54		0	0	78		16:30	410		300		0	0	710	
04:45	43	95	72	196	0	0	115	291	16:45	425	1610	312	1147	0	0	737	2757
05:00	22		75		0	0	97		17:00	412		323		0	0	735	
05:15	55		101		0	0	156		17:15	451		330		0	0	781	
05:30	34		154		0	0	188		17:30	469		347		0	0	816	
05:45	69	180	144	474	0	0	213	654	17:45	403	1735	310	1310	0	0	713	3045
06:00	87		152		0	0	239		18:00	397		329		0	0	726	
06:15	121		217		0	0	338		18:15	405		308		0	0	713	
06:30	135		280		0	0	415		18:30	350		258		0	0	608	
06:45	199	542	331	980	0	0	530	1522	18:45	359	1511	246	1141	0	0	605	2652
07:00	169		365		0	0	534		19:00	336		192		0	0	528	
07:15	188		368		0	0	556		19:15	325		212		0	0	537	
07:30	216		424		0	0	640		19:30	276		154		0	0	430	
07:45	356	929	590	1747	0	0	946	2676	19:45	275	1212	162	720	0	0	437	1932
08:00	274		488		0	0	762		20:00	243		138		0	0	381	
08:15	297		466		0	0	763		20:15	228		157		0	0	385	
08:30	246		403		0	0	649		20:30	242		129		0	0	371	
08:45	244	1061	349	1706	0	0	593	2767	20:45	285	998	104	528	0	0	389	1526
09:00	188		290		0	0	478		21:00	215		124		0	0	339	
09:15	203		338		0	0	541		21:15	177		160		0	0	337	
09:30	165		269		0	0	434		21:30	205		114		0	0	319	
09:45	169	725	311	1208	0	0	480	1933	21:45	145	742	77	475	0	0	222	1217
10:00	201		261		0	0	462		22:00	172		100		0	0	272	
10:15	159		235		0	0	394		22:15	126		75		0	0	201	
10:30	220		258		0	0	478		22:30	117		55		0	0	172	
10:45	211	791	286	1040	0	0	497	1831	22:45	103	518	43	273	0	0	146	791
11:00	194		246		0	0	440		23:00	82		43		0	0	125	
11:15	229		225		0	0	454		23:15	73		43		0	0	116	
11:30	248		292		0	0	540		23:30	61		31		0	0	92	
11:45	277	948	280	1043	0	0	557	1991	23:45	52	268	33	150	0	0	85	418
TOTALS		5559		8693				14252	TOTALS		13969		10318				24287
SPLIT %		39.0%		61.0%				37.0%	SPLIT %		57.5%		42.5%				63.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	19,528	19,011	0	0	38,539

AM Peak Hour	07:45	07:30			07:45	PM Peak Hour	16:45	17:15			16:45
AM Pk Volume	1173	1968			3120	PM Pk Volume	1757	1316			3069
Pk Hr Factor	0.824	0.834			0.825	Pk Hr Factor	0.937	0.948			0.940
7 - 9 Volume	1990	3453	0	0	5443	4 - 6 Volume	3345	2457	0	0	5802
7 - 9 Peak Hour	07:45	07:30			07:45	4 - 6 Peak Hour	16:45	16:45			16:45
7 - 9 Pk Volume	1173	1968	0	0	3120	4 - 6 Pk Volume	1757	1312	0	0	3069
Pk Hr Factor	0.824	0.834	0.000	0.000	0.825	Pk Hr Factor	0.937	0.945	0.000	0.000	0.940

Prepared by NDS/ATD

VOLUME

El Toro Rd N/O Muirlands Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_064

DAILY TOTALS	NB	SB	EB	WB	Total
	20,415	20,318	0	0	40,733

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	26		23						49		12:00	300		325						625	
00:15	32		22						54		12:15	276		299						575	
00:30	33		24						57		12:30	317		325						642	
00:45	34	125	18	87					52	212	12:45	334	1227	295	1244					629	2471
01:00	20		16						36		13:00	354		273						627	
01:15	21		17						38		13:15	347		269						616	
01:30	16		13						29		13:30	292		299						591	
01:45	20	77	8	54					28	131	13:45	328	1321	264	1105					592	2426
02:00	12		8						20		14:00	351		254						605	
02:15	18		9						27		14:15	324		369						693	
02:30	14		11						25		14:30	316		354						670	
02:45	19	63	12	40					31	103	14:45	397	1388	348	1325					745	2713
03:00	8		19						27		15:00	462		317						779	
03:15	12		16						28		15:15	356		355						711	
03:30	15		23						38		15:30	380		290						670	
03:45	19	54	26	84					45	138	15:45	380	1578	324	1286					704	2864
04:00	16		32						48		16:00	381		344						725	
04:15	14		57						71		16:15	408		299						707	
04:30	29		50						79		16:30	442		280						722	
04:45	29	88	85	224					114	312	16:45	419	1650	303	1226					722	2876
05:00	29		79						108		17:00	451		289						740	
05:15	44		106						150		17:15	489		313						802	
05:30	63		135						198		17:30	457		288						745	
05:45	76	212	145	465					221	677	17:45	417	1814	309	1199					726	3013
06:00	73		201						274		18:00	413		247						660	
06:15	135		229						364		18:15	401		244						645	
06:30	145		333						478		18:30	386		273						659	
06:45	168	521	349	1112					517	1633	18:45	370	1570	242	1006					612	2576
07:00	149		379						528		19:00	349		270						619	
07:15	211		411						622		19:15	360		200						560	
07:30	241		537						778		19:30	314		205						519	
07:45	327	928	506	1833					833	2761	19:45	288	1311	190	865					478	2176
08:00	293		574						867		20:00	269		209						478	
08:15	240		522						762		20:15	279		190						469	
08:30	261		416						677		20:30	260		150						410	
08:45	209	1003	446	1958					655	2961	20:45	265	1073	127	676					392	1749
09:00	216		333						549		21:00	211		133						344	
09:15	206		311						517		21:15	216		137						353	
09:30	217		289						506		21:30	188		148						336	
09:45	239	878	318	1251					557	2129	21:45	162	777	115	533					277	1310
10:00	208		278						486		22:00	126		103						229	
10:15	252		292						544		22:15	146		84						230	
10:30	236		259						495		22:30	100		63						163	
10:45	218	914	288	1117					506	2031	22:45	86	458	60	310					146	768
11:00	266		270						536		23:00	102		52						154	
11:15	264		298						562		23:15	75		44						119	
11:30	264		286						550		23:30	63		30						93	
11:45	292	1086	309	1163					601	2249	23:45	59	299	29	155					88	454
TOTALS		5949		9388						15337	TOTALS		14466		10930						25396
SPLIT %		38.8%		61.2%						37.7%	SPLIT %		57.0%		43.0%						62.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	20,415	20,318	0	0	40,733

AM Peak Hour	11:45	07:30			07:30	PM Peak Hour	16:45	14:15			17:00
AM Pk Volume	1185	2139			3240	PM Pk Volume	1816	1388			3013
Pk Hr Factor	0.935	0.932			0.934	Pk Hr Factor	0.928	0.940			0.939
7 - 9 Volume	1931	3791	0	0	5722	4 - 6 Volume	3464	2425	0	0	5889
7 - 9 Peak Hour	07:45	07:30			07:30	4 - 6 Peak Hour	16:45	16:00			17:00
7 - 9 Pk Volume	1121	2139	0	0	3240	4 - 6 Pk Volume	1816	1226	0	0	3013
Pk Hr Factor	0.857	0.932	0.000	0.000	0.934	Pk Hr Factor	0.928	0.891	0.000	0.000	0.939

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

El Toro Rd S/O Muirlands Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_065

DAILY TOTALS	NB	SB	EB	WB	Total
	21,528	23,188	0	0	44,716

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	15		23		0	0	38		12:00	308		415		0	0	723	
00:15	41		28		0	0	69		12:15	345		404		0	0	749	
00:30	31		20		0	0	51		12:30	369		435		0	0	804	
00:45	43	130	16	87	0	0	59	217	12:45	363	1385	405	1659	0	0	768	3044
01:00	19		14		0	0	33		13:00	414		350		0	0	764	
01:15	18		21		0	0	39		13:15	412		352		0	0	764	
01:30	17		16		0	0	33		13:30	353		353		0	0	706	
01:45	26	80	11	62	0	0	37	142	13:45	364	1543	353	1408	0	0	717	2951
02:00	14		10		0	0	24		14:00	390		350		0	0	740	
02:15	15		11		0	0	26		14:15	343		373		0	0	716	
02:30	14		16		0	0	30		14:30	382		376		0	0	758	
02:45	20	63	19	56	0	0	39	119	14:45	403	1518	427	1526	0	0	830	3044
03:00	5		21		0	0	26		15:00	500		354		0	0	854	
03:15	10		16		0	0	26		15:15	367		441		0	0	808	
03:30	14		24		0	0	38		15:30	372		353		0	0	725	
03:45	12	41	25	86	0	0	37	127	15:45	439	1678	392	1540	0	0	831	3218
04:00	11		30		0	0	41		16:00	435		398		0	0	833	
04:15	8		53		0	0	61		16:15	467		379		0	0	846	
04:30	30		62		0	0	92		16:30	469		334		0	0	803	
04:45	19	68	87	232	0	0	106	300	16:45	417	1788	369	1480	0	0	786	3268
05:00	25		84		0	0	109		17:00	491		341		0	0	832	
05:15	36		108		0	0	144		17:15	515		403		0	0	918	
05:30	62		137		0	0	199		17:30	449		367		0	0	816	
05:45	68	191	172	501	0	0	240	692	17:45	438	1893	367	1478	0	0	805	3371
06:00	91		199		0	0	290		18:00	434		355		0	0	789	
06:15	110		238		0	0	348		18:15	429		317		0	0	746	
06:30	153		343		0	0	496		18:30	393		307		0	0	700	
06:45	156	510	355	1135	0	0	511	1645	18:45	383	1639	303	1282	0	0	686	2921
07:00	172		399		0	0	571		19:00	371		334		0	0	705	
07:15	177		414		0	0	591		19:15	355		240		0	0	595	
07:30	207		510		0	0	717		19:30	327		252		0	0	579	
07:45	252	808	434	1757	0	0	686	2565	19:45	300	1353	224	1050	0	0	524	2403
08:00	257		527		0	0	784		20:00	282		242		0	0	524	
08:15	237		542		0	0	779		20:15	285		198		0	0	483	
08:30	264		428		0	0	692		20:30	279		168		0	0	447	
08:45	204	962	432	1929	0	0	636	2891	20:45	270	1116	150	758	0	0	420	1874
09:00	211		380		0	0	591		21:00	250		129		0	0	379	
09:15	216		348		0	0	564		21:15	185		146		0	0	331	
09:30	232		315		0	0	547		21:30	192		147		0	0	339	
09:45	263	922	377	1420	0	0	640	2342	21:45	162	789	112	534	0	0	274	1323
10:00	235		342		0	0	577		22:00	146		85		0	0	231	
10:15	288		318		0	0	606		22:15	144		79		0	0	223	
10:30	266		307		0	0	573		22:30	102		58		0	0	160	
10:45	253	1042	306	1273	0	0	559	2315	22:45	101	493	58	280	0	0	159	773
11:00	271		346		0	0	617		23:00	103		49		0	0	152	
11:15	309		376		0	0	685		23:15	65		42		0	0	107	
11:30	322		367		0	0	689		23:30	76		30		0	0	106	
11:45	319	1221	418	1507	0	0	737	2728	23:45	51	295	27	148	0	0	78	443
TOTALS		6038		10045				16083	TOTALS		15490		13143				28633
SPLIT %		37.5%		62.5%				36.0%	SPLIT %		54.1%		45.9%				64.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	21,528	23,188	0	0	44,716

AM Peak Hour	11:45	07:30			11:45	PM Peak Hour	17:00	12:00			17:00
AM Pk Volume	1341	2013			3013	PM Pk Volume	1893	1659			3371
Pk Hr Factor	0.909	0.929			0.937	Pk Hr Factor	0.919	0.953			0.918
7 - 9 Volume	1770	3686	0	0	5456	4 - 6 Volume	3681	2958	0	0	6639
7 - 9 Peak Hour	07:45	07:30			07:30	4 - 6 Peak Hour	17:00	16:00			17:00
7 - 9 Pk Volume	1010	2013	0	0	2966	4 - 6 Pk Volume	1893	1480	0	0	3371
Pk Hr Factor	0.956	0.929	0.000	0.000	0.946	Pk Hr Factor	0.919	0.930	0.000	0.000	0.918

Prepared by NDS/ATD

VOLUME

El Toro Rd S/O Rockfield Blvd

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_066

DAILY TOTALS	NB	SB	EB	WB	Total
	27,702	26,326	0	0	54,028

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	70		44						114		12:00	499		408						907	
00:15	59		34						93		12:15	510		467						977	
00:30	47		29						76		12:30	538		453						991	
00:45	51	227	28	135					79	362	12:45	534	2081	448	1776					982	3857
01:00	33		27						60		13:00	520		466						986	
01:15	20		25						45		13:15	493		473						966	
01:30	25		26						51		13:30	476		474						950	
01:45	23	101	16	94					39	195	13:45	525	2014	437	1850					962	3864
02:00	13		13						26		14:00	461		427						888	
02:15	12		13						25		14:15	491		458						949	
02:30	20		17						37		14:30	453		413						866	
02:45	24	69	17	60					41	129	14:45	533	1938	394	1692					927	3630
03:00	15		24						39		15:00	472		381						853	
03:15	16		20						36		15:15	478		433						911	
03:30	23		42						65		15:30	508		364						872	
03:45	13	67	37	123					50	190	15:45	525	1983	381	1559					906	3542
04:00	25		43						68		16:00	491		359						850	
04:15	28		68						96		16:15	502		368						870	
04:30	38		96						134		16:30	518		371						889	
04:45	39	130	107	314					146	444	16:45	552	2063	402	1500					954	3563
05:00	48		114						162		17:00	584		363						947	
05:15	51		141						192		17:15	552		398						950	
05:30	67		181						248		17:30	521		344						865	
05:45	106	272	207	643					313	915	17:45	466	2123	392	1497					858	3620
06:00	135		226						361		18:00	509		416						925	
06:15	151		311						462		18:15	457		372						829	
06:30	178		394						572		18:30	443		369						812	
06:45	205	669	408	1339					613	2008	18:45	430	1839	366	1523					796	3362
07:00	201		468						669		19:00	451		328						779	
07:15	247		466						713		19:15	401		340						741	
07:30	280		511						791		19:30	369		329						698	
07:45	329	1057	467	1912					796	2969	19:45	353	1574	262	1259					615	2833
08:00	305		493						798		20:00	359		296						655	
08:15	296		463						759		20:15	330		288						618	
08:30	296		489						785		20:30	331		274						605	
08:45	335	1232	382	1827					717	3059	20:45	288	1308	264	1122					552	2430
09:00	333		353						686		21:00	245		235						480	
09:15	346		414						760		21:15	260		191						451	
09:30	378		377						755		21:30	235		195						430	
09:45	391	1448	368	1512					759	2960	21:45	211	951	185	806					396	1757
10:00	376		347						723		22:00	207		158						365	
10:15	427		383						810		22:15	164		136						300	
10:30	408		389						797		22:30	142		103						245	
10:45	433	1644	393	1512					826	3156	22:45	114	627	95	492					209	1119
11:00	393		358						751		23:00	127		81						208	
11:15	461		363						824		23:15	89		66						155	
11:30	515		400						915		23:30	87		61						148	
11:45	524	1893	400	1521					924	3414	23:45	89	392	50	258					139	650
TOTALS		8809		10992						19801	TOTALS		18893		15334						34227
SPLIT %		44.5%		55.5%						36.6%	SPLIT %		55.2%		44.8%						63.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	27,702	26,326	0	0	54,028

AM Peak Hour	11:45	07:15			11:45	PM Peak Hour	16:45	12:45			12:15
AM Pk Volume	2071	1937			3799	PM Pk Volume	2209	1861			3936
Pk Hr Factor	0.962	0.948			0.958	Pk Hr Factor	0.946	0.982			0.993
7 - 9 Volume	2289	3739	0	0	6028	4 - 6 Volume	4186	2997	0	0	7183
7 - 9 Peak Hour	08:00	07:15			07:30	4 - 6 Peak Hour	16:45	16:30			16:30
7 - 9 Pk Volume	1232	1937	0	0	3144	4 - 6 Pk Volume	2209	1534	0	0	3740
Pk Hr Factor	0.919	0.948	0.000	0.000	0.985	Pk Hr Factor	0.946	0.954	0.000	0.000	0.980

Prepared by NDS/ATD

VOLUME

Los Alisos Blvd N/O Jeronimo Rd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_067

DAILY TOTALS	NB	SB	EB	WB	Total
	14,855	14,119	0	0	28,974

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	27		21						48		12:00	180		170						350	
00:15	22		15						37		12:15	208		174						382	
00:30	9		10						19		12:30	195		185						380	
00:45	8	66	7	53					15	119	12:45	208	791	201	730					409	1521
01:00	11		6						17		13:00	208		232						440	
01:15	15		9						24		13:15	224		215						439	
01:30	12		4						16		13:30	217		247						464	
01:45	6	44	4	23					10	67	13:45	224	873	200	894					424	1767
02:00	11		5						16		14:00	242		189						431	
02:15	6		8						14		14:15	255		196						451	
02:30	5		4						9		14:30	236		175						411	
02:45	7	29	5	22					12	51	14:45	232	965	226	786					458	1751
03:00	6		6						12		15:00	411		230						641	
03:15	7		10						17		15:15	315		222						537	
03:30	7		15						22		15:30	333		198						531	
03:45	15	35	21	52					36	87	15:45	300	1359	244	894					544	2253
04:00	5		13						18		16:00	322		200						522	
04:15	5		25						30		16:15	373		213						586	
04:30	9		30						39		16:30	366		221						587	
04:45	11	30	50	118					61	148	16:45	367	1428	209	843					576	2271
05:00	8		56						64		17:00	389		186						575	
05:15	14		76						90		17:15	414		216						630	
05:30	27		98						125		17:30	418		234						652	
05:45	36	85	106	336					142	421	17:45	382	1603	211	847					593	2450
06:00	46		133						179		18:00	350		223						573	
06:15	51		149						200		18:15	346		194						540	
06:30	57		242						299		18:30	319		208						527	
06:45	91	245	285	809					376	1054	18:45	246	1261	154	779					400	2040
07:00	84		338						422		19:00	252		167						419	
07:15	111		347						458		19:15	276		133						409	
07:30	143		443						586		19:30	234		122						356	
07:45	239	577	514	1642					753	2219	19:45	216	978	120	542					336	1520
08:00	239		401						640		20:00	208		111						319	
08:15	230		403						633		20:15	203		99						302	
08:30	181		369						550		20:30	155		92						247	
08:45	176	826	303	1476					479	2302	20:45	184	750	78	380					262	1130
09:00	141		212						353		21:00	141		114						255	
09:15	148		204						352		21:15	143		78						221	
09:30	145		214						359		21:30	127		71						198	
09:45	157	591	183	813					340	1404	21:45	110	521	57	320					167	841
10:00	134		208						342		22:00	89		44						133	
10:15	136		172						308		22:15	85		61						146	
10:30	138		186						324		22:30	61		46						107	
10:45	166	574	187	753					353	1327	22:45	51	286	30	181					81	467
11:00	165		187						352		23:00	54		34						88	
11:15	176		192						368		23:15	52		27						79	
11:30	200		187						387		23:30	44		22						66	
11:45	217	758	164	730					381	1488	23:45	30	180	13	96					43	276
TOTALS		3860		6827						10687	TOTALS		10995		7292						18287
SPLIT %		36.1%		63.9%						36.9%	SPLIT %		60.1%		39.9%						63.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	14,855	14,119	0	0	28,974

AM Peak Hour	07:45	07:30			07:30	PM Peak Hour	17:00	12:45			17:00
AM Pk Volume	889	1761			2612	PM Pk Volume	1603	895			2450
Pk Hr Factor	0.930	0.857			0.867	Pk Hr Factor	0.959	0.906			0.939
7 - 9 Volume	1403	3118	0	0	4521	4 - 6 Volume	3031	1690	0	0	4721
7 - 9 Peak Hour	07:45	07:30			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	889	1761	0	0	2612	4 - 6 Pk Volume	1603	847	0	0	2450
Pk Hr Factor	0.930	0.857	0.000	0.000	0.867	Pk Hr Factor	0.959	0.905	0.000	0.000	0.939

Prepared by NDS/ATD

VOLUME

Los Alisos Blvd N/O Muirlands Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_068

DAILY TOTALS	NB	SB	EB	WB	Total
	14,465	15,536	0	0	30,001

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	20		13						33		12:00	238		201						439	
00:15	14		11						25		12:15	212		191						403	
00:30	16		15						31		12:30	182		206						388	
00:45	19	69	13	52					32	121	12:45	189	821	183	781					372	1602
01:00	7		12						19		13:00	198		216						414	
01:15	9		7						16		13:15	213		199						412	
01:30	14		10						24		13:30	206		218						424	
01:45	12	42	9	38					21	80	13:45	234	851	231	864					465	1715
02:00	7		6						13		14:00	216		200						416	
02:15	6		3						9		14:15	280		248						528	
02:30	8		5						13		14:30	227		228						455	
02:45	4	25	8	22					12	47	14:45	270	993	291	967					561	1960
03:00	7		5						12		15:00	392		283						675	
03:15	6		6						12		15:15	335		278						613	
03:30	7		10						17		15:30	300		247						547	
03:45	4	24	13	34					17	58	15:45	283	1310	275	1083					558	2393
04:00	6		18						24		16:00	321		261						582	
04:15	10		19						29		16:15	337		265						602	
04:30	9		27						36		16:30	292		250						542	
04:45	24	49	54	118					78	167	16:45	354	1304	266	1042					620	2346
05:00	17		51						68		17:00	389		270						659	
05:15	20		68						88		17:15	462		297						759	
05:30	21		94						115		17:30	397		271						668	
05:45	44	102	134	347					178	449	17:45	369	1617	269	1107					638	2724
06:00	35		121						156		18:00	354		237						591	
06:15	54		137						191		18:15	303		253						556	
06:30	89		228						317		18:30	306		223						529	
06:45	97	275	301	787					398	1062	18:45	259	1222	204	917					463	2139
07:00	105		280						385		19:00	277		231						508	
07:15	129		356						485		19:15	224		190						414	
07:30	153		381						534		19:30	234		175						409	
07:45	271	658	442	1459					713	2117	19:45	198	933	161	757					359	1690
08:00	297		381						678		20:00	198		157						355	
08:15	188		394						582		20:15	141		139						280	
08:30	170		353						523		20:30	178		113						291	
08:45	150	805	352	1480					502	2285	20:45	140	657	150	559					290	1216
09:00	160		229						389		21:00	153		120						273	
09:15	131		234						365		21:15	132		109						241	
09:30	132		221						353		21:30	97		62						159	
09:45	132	555	220	904					352	1459	21:45	93	475	77	368					170	843
10:00	144		186						330		22:00	77		54						131	
10:15	120		229						349		22:15	71		52						123	
10:30	153		198						351		22:30	57		45						102	
10:45	127	544	179	792					306	1336	22:45	59	264	39	190					98	454
11:00	130		194						324		23:00	62		48						110	
11:15	197		173						370		23:15	41		29						70	
11:30	201		197						398		23:30	32		25						57	
11:45	178	706	181	745					359	1451	23:45	29	164	21	123					50	287
TOTALS		3854		6778						10632	TOTALS		10611		8758						19369
SPLIT %		36.2%		63.8%						35.4%	SPLIT %		54.8%		45.2%						64.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	14,465	15,536	0	0	30,001

AM Peak Hour	07:45	07:30			07:30	PM Peak Hour	17:00	17:00			17:00
AM Pk Volume	926	1598			2507	PM Pk Volume	1617	1107			2724
Pk Hr Factor	0.779	0.904			0.879	Pk Hr Factor	0.875	0.932			0.897
7 - 9 Volume	1463	2939	0	0	4402	4 - 6 Volume	2921	2149	0	0	5070
7 - 9 Peak Hour	07:45	07:30			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	926	1598	0	0	2507	4 - 6 Pk Volume	1617	1107	0	0	2724
Pk Hr Factor	0.779	0.904	0.000	0.000	0.879	Pk Hr Factor	0.875	0.932	0.000	0.000	0.897

Prepared by NDS/ATD

VOLUME

Los Alisos Blvd S/O Muirlands Blvd

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_069

DAILY TOTALS	NB	SB	EB	WB	Total
	14,209	13,075	0	0	27,284

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	23		14						37		12:00	223		179						402	
00:15	16		7						23		12:15	181		168						349	
00:30	22		9						31		12:30	191		189						380	
00:45	20	81	9	39					29	120	12:45	203	798	175	711					378	1509
01:00	15		3						18		13:00	189		179						368	
01:15	11		7						18		13:15	194		164						358	
01:30	13		5						18		13:30	186		190						376	
01:45	9	48	7	22					16	70	13:45	227	796	222	755					449	1551
02:00	11		7						18		14:00	199		166						365	
02:15	8		2						10		14:15	294		204						498	
02:30	5		3						8		14:30	247		223						470	
02:45	3	27	5	17					8	44	14:45	287	1027	244	837					531	1864
03:00	6		4						10		15:00	350		278						628	
03:15	6		8						14		15:15	278		257						535	
03:30	10		9						19		15:30	280		231						511	
03:45	5	27	10	31					15	58	15:45	291	1199	248	1014					539	2213
04:00	9		16						25		16:00	320		230						550	
04:15	8		16						24		16:15	299		224						523	
04:30	16		22						38		16:30	294		177						471	
04:45	30	63	40	94					70	157	16:45	337	1250	219	850					556	2100
05:00	19		49						68		17:00	353		228						581	
05:15	23		58						81		17:15	411		243						654	
05:30	31		84						115		17:30	357		230						587	
05:45	51	124	114	305					165	429	17:45	322	1443	247	948					569	2391
06:00	33		105						138		18:00	292		196						488	
06:15	58		114						172		18:15	274		220						494	
06:30	111		176						287		18:30	295		187						482	
06:45	104	306	272	667					376	973	18:45	271	1132	151	754					422	1886
07:00	116		244						360		19:00	247		166						413	
07:15	157		255						412		19:15	205		145						350	
07:30	203		355						558		19:30	207		135						342	
07:45	314	790	301	1155					615	1945	19:45	212	871	134	580					346	1451
08:00	268		292						560		20:00	183		118						301	
08:15	219		296						515		20:15	164		118						282	
08:30	192		298						490		20:30	158		107						265	
08:45	174	853	290	1176					464	2029	20:45	147	652	97	440					244	1092
09:00	159		208						367		21:00	123		92						215	
09:15	137		203						340		21:15	124		86						210	
09:30	147		177						324		21:30	112		67						179	
09:45	144	587	181	769					325	1356	21:45	86	445	64	309					150	754
10:00	144		164						308		22:00	71		60						131	
10:15	122		195						317		22:15	72		44						116	
10:30	146		160						306		22:30	54		39						93	
10:45	148	560	152	671					300	1231	22:45	59	256	31	174					90	430
11:00	157		173						330		23:00	61		37						98	
11:15	169		159						328		23:15	41		29						70	
11:30	168		156						324		23:30	41		23						64	
11:45	206	700	165	653					371	1353	23:45	31	174	15	104					46	278
TOTALS		4166		5599						9765	TOTALS		10043		7476						17519
SPLIT %		42.7%		57.3%						35.8%	SPLIT %		57.3%		42.7%						64.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	14,209	13,075	0	0	27,284

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	16:45	15:00			17:00
AM Pk Volume	1004	1244			2248	PM Pk Volume	1458	1014			2391
Pk Hr Factor	0.799	0.876			0.914	Pk Hr Factor	0.887	0.912			0.914
7 - 9 Volume	1643	2331	0	0	3974	4 - 6 Volume	2693	1798	0	0	4491
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	1004	1244	0	0	2248	4 - 6 Pk Volume	1458	948	0	0	2391
Pk Hr Factor	0.799	0.876	0.000	0.000	0.914	Pk Hr Factor	0.887	0.960	0.000	0.000	0.914

Prepared by NDS/ATD

VOLUME

Los Alisos Blvd S/O Rockfield Blvd

Day: Wednesday
Date: 4/18/2018

City: Lake Forest
Project #: CA18_1076_070

DAILY TOTALS	NB	SB	EB	WB	Total
	12,758	12,289	0	0	25,047

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	18		16						34		12:00	221		175						396	
00:15	13		11						24		12:15	182		179						361	
00:30	13		8						21		12:30	170		209						379	
00:45	9	53	10	45					19	98	12:45	226	799	211	774					437	1573
01:00	7		5						12		13:00	221		185						406	
01:15	9		5						14		13:15	224		194						418	
01:30	11		5						16		13:30	235		247						482	
01:45	5	32	8	23					13	55	13:45	211	891	244	870					455	1761
02:00	4		3						7		14:00	196		157						353	
02:15	6		4						10		14:15	167		191						358	
02:30	3		2						5		14:30	198		223						421	
02:45	5	18	7	16					12	34	14:45	228	789	197	768					425	1557
03:00	4		8						12		15:00	225		185						410	
03:15	2		9						11		15:15	241		184						425	
03:30	6		7						13		15:30	250		192						442	
03:45	11	23	8	32					19	55	15:45	249	965	202	763					451	1728
04:00	4		8						12		16:00	274		187						461	
04:15	6		10						16		16:15	280		239						519	
04:30	8		14						22		16:30	288		213						501	
04:45	19	37	29	61					48	98	16:45	298	1140	227	866					525	2006
05:00	16		19						35		17:00	332		208						540	
05:15	20		32						52		17:15	372		267						639	
05:30	23		50						73		17:30	344		215						559	
05:45	35	94	86	187					121	281	17:45	302	1350	252	942					554	2292
06:00	36		61						97		18:00	263		183						446	
06:15	47		94						141		18:15	277		243						520	
06:30	64		142						206		18:30	222		188						410	
06:45	111	258	234	531					345	789	18:45	215	977	160	774					375	1751
07:00	111		203						314		19:00	189		175						364	
07:15	143		220						363		19:15	179		185						364	
07:30	196		276						472		19:30	155		116						271	
07:45	302	752	289	988					591	1740	19:45	165	688	151	627					316	1315
08:00	222		255						477		20:00	145		127						272	
08:15	208		272						480		20:15	159		123						282	
08:30	183		271						454		20:30	143		106						249	
08:45	169	782	250	1048					419	1830	20:45	133	580	83	439					216	1019
09:00	116		151						267		21:00	110		90						200	
09:15	121		181						302		21:15	104		86						190	
09:30	160		183						343		21:30	84		68						152	
09:45	129	526	123	638					252	1164	21:45	81	379	71	315					152	694
10:00	151		132						283		22:00	74		83						157	
10:15	135		166						301		22:15	69		43						112	
10:30	148		141						289		22:30	49		40						89	
10:45	128	562	165	604					293	1166	22:45	41	233	40	206					81	439
11:00	141		146						287		23:00	49		38						87	
11:15	166		156						322		23:15	44		29						73	
11:30	176		197						373		23:30	38		20						58	
11:45	190	673	170	669					360	1342	23:45	26	157	16	103					42	260
TOTALS		3810		4842						8652	TOTALS		8948		7447						16395
SPLIT %		44.0%		56.0%						34.5%	SPLIT %		54.6%		45.4%						65.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	12,758	12,289	0	0	25,047

AM Peak Hour	07:30	07:30			07:30	PM Peak Hour	17:00	17:00			17:00
AM Pk Volume	928	1092			2020	PM Pk Volume	1350	942			2292
Pk Hr Factor	0.768	0.945			0.854	Pk Hr Factor	0.907	0.882			0.897
7 - 9 Volume	1534	2036	0	0	3570	4 - 6 Volume	2490	1808	0	0	4298
7 - 9 Peak Hour	07:30	07:30			07:30	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	928	1092	0	0	2020	4 - 6 Pk Volume	1350	942	0	0	2292
Pk Hr Factor	0.768	0.945	0.000	0.000	0.854	Pk Hr Factor	0.907	0.882	0.000	0.000	0.897

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Commercentre Dr E/O Alton Pkwy

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_071

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,458	4,088	7,546

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	2		4		6		12:00	0	0	43		77		120	
00:15	0	0	0		0				12:15	0	0	49		54		103	
00:30	0	0	2		3		5		12:30	0	0	52		63		115	
00:45	0	0	0	4	1	8	1	12	12:45	0	0	50	194	57	251	107	445
01:00	0	0	0		1		1		13:00	0	0	41		56		97	
01:15	0	0	1		5		6		13:15	0	0	37		45		82	
01:30	0	0	0		1		1		13:30	0	0	48		55		103	
01:45	0	0	0	1	0	7		8	13:45	0	0	46	172	34	190	80	362
02:00	0	0	1		1		2		14:00	0	0	42		66		108	
02:15	0	0	1		1		2		14:15	0	0	43		41		84	
02:30	0	0	0		2		2		14:30	0	0	40		81		121	
02:45	0	0	0	2	0	4		6	14:45	0	0	46	171	74	262	120	433
03:00	0	0	2		1		3		15:00	0	0	42		96		138	
03:15	0	0	0		0				15:15	0	0	39		88		127	
03:30	0	0	3		2		5		15:30	0	0	53		156		209	
03:45	0	0	4	9	2	5	6	14	15:45	0	0	32	166	103	443	135	609
04:00	0	0	5		2		7		16:00	0	0	27		143		170	
04:15	0	0	7		2		9		16:15	0	0	30		129		159	
04:30	0	0	19		4		23		16:30	0	0	38		149		187	
04:45	0	0	35	66	8	16	43	82	16:45	0	0	38	133	118	539	156	672
05:00	0	0	16		7		23		17:00	0	0	47		228		275	
05:15	0	0	13		6		19		17:15	0	0	63		183		246	
05:30	0	0	22		8		30		17:30	0	0	47		168		215	
05:45	0	0	59	110	18	39	77	149	17:45	0	0	53	210	121	700	174	910
06:00	0	0	46		14		60		18:00	0	0	28		119		147	
06:15	0	0	63		21		84		18:15	0	0	25		84		109	
06:30	0	0	66		26		92		18:30	0	0	22		89		111	
06:45	0	0	88	263	35	96	123	359	18:45	0	0	19	94	50	342	69	436
07:00	0	0	80		38		118		19:00	0	0	26		58		84	
07:15	0	0	110		54		164		19:15	0	0	19		50		69	
07:30	0	0	101		55		156		19:30	0	0	14		19		33	
07:45	0	0	138	429	50	197	188	626	19:45	0	0	18	77	31	158	49	235
08:00	0	0	117		54		171		20:00	0	0	17		31		48	
08:15	0	0	141		44		185		20:15	0	0	13		19		32	
08:30	0	0	181		47		228		20:30	0	0	10		19		29	
08:45	0	0	131	570	39	184	170	754	20:45	0	0	13	53	17	86	30	139
09:00	0	0	123		43		166		21:00	0	0	5		26		31	
09:15	0	0	101		34		135		21:15	0	0	4		17		21	
09:30	0	0	91		34		125		21:30	0	0	3		10		13	
09:45	0	0	71	386	41	152	112	538	21:45	0	0	6	18	10	63	16	81
10:00	0	0	52		34		86		22:00	0	0	15		6		21	
10:15	0	0	39		28		67		22:15	0	0	4		4		8	
10:30	0	0	34		33		67		22:30	0	0	3		14		17	
10:45	0	0	35	160	36	131	71	291	22:45	0	0	1	23	8	32	9	55
11:00	0	0	42		28		70		23:00	0	0	2		5		7	
11:15	0	0	34		22		56		23:15	0	0	2		3		5	
11:30	0	0	26		47		73		23:30	0	0	1		5		6	
11:45	0	0	38	140	70	167	108	307	23:45	0	0	2	7	3	16	5	23
TOTALS				2140		1006		3146	TOTALS				1318		3082		4400
SPLIT %				68.0%		32.0%		41.7%	SPLIT %				30.0%		70.0%		58.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,458	4,088	7,546

AM Peak Hour			07:45	11:45	07:45	PM Peak Hour			17:00	17:00	17:00
AM Pk Volume			577	264	772	PM Pk Volume			210	700	910
Pk Hr Factor			0.797	0.857	0.846	Pk Hr Factor			0.833	0.768	0.827
7 - 9 Volume	0	0	999	381	1380	4 - 6 Volume	0	0	343	1239	1582
7 - 9 Peak Hour			07:45	07:15	07:45	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	577	213	772	4 - 6 Pk Volume	0	0	210	700	910
Pk Hr Factor	0.000	0.000	0.797	0.968	0.846	Pk Hr Factor	0.000	0.000	0.833	0.768	0.827

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Dimension Dr N/O Commercentre Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_081

DAILY TOTALS	NB	SB	EB	WB	Total
	2,992	2,971	0	0	5,963

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	0		3		0	0	3		12:00	93		73		0	0	166	
00:15	2		1		0	0	3		12:15	77		78		0	0	155	
00:30	1		2		0	0	3		12:30	82		77		0	0	159	
00:45	1	4	2	8	0	0	3	12	12:45	59	311	61	289	0	0	120	600
01:00	2		1		0	0	3		13:00	53		73		0	0	126	
01:15	0		1		0	0	1		13:15	48		64		0	0	112	
01:30	0		3		0	0	3		13:30	42		56		0	0	98	
01:45	0	2	0	5	0	0		7	13:45	51	194	49	242	0	0	100	436
02:00	1		2		0	0	3		14:00	45		51		0	0	96	
02:15	1		0		0	0	1		14:15	40		32		0	0	72	
02:30	0		2		0	0	2		14:30	31		50		0	0	81	
02:45	0	2	0	4	0	0		6	14:45	39	155	50	183	0	0	89	338
03:00	0		0		0	0			15:00	44		44		0	0	88	
03:15	1		1		0	0	2		15:15	53		67		0	0	120	
03:30	5		1		0	0	6		15:30	61		44		0	0	105	
03:45	1	7	0	2	0	0	1	9	15:45	38	196	61	216	0	0	99	412
04:00	2		1		0	0	3		16:00	59		46		0	0	105	
04:15	1		0		0	0	1		16:15	49		59		0	0	108	
04:30	6		4		0	0	10		16:30	65		62		0	0	127	
04:45	4	13	4	9	0	0	8	22	16:45	56	229	76	243	0	0	132	472
05:00	8		8		0	0	16		17:00	97		121		0	0	218	
05:15	10		7		0	0	17		17:15	69		66		0	0	135	
05:30	6		2		0	0	8		17:30	77		65		0	0	142	
05:45	14	38	13	30	0	0	27	68	17:45	45	288	65	317	0	0	110	605
06:00	17		14		0	0	31		18:00	47		50		0	0	97	
06:15	10		17		0	0	27		18:15	44		43		0	0	87	
06:30	24		21		0	0	45		18:30	55		44		0	0	99	
06:45	40	91	31	83	0	0	71	174	18:45	33	179	42	179	0	0	75	358
07:00	44		31		0	0	75		19:00	31		41		0	0	72	
07:15	40		26		0	0	66		19:15	27		24		0	0	51	
07:30	39		32		0	0	71		19:30	28		37		0	0	65	
07:45	54	177	62	151	0	0	116	328	19:45	14	100	29	131	0	0	43	231
08:00	69		40		0	0	109		20:00	33		29		0	0	62	
08:15	71		71		0	0	142		20:15	23		24		0	0	47	
08:30	86		55		0	0	141		20:30	13		22		0	0	35	
08:45	67	293	54	220	0	0	121	513	20:45	13	82	20	95	0	0	33	177
09:00	45		53		0	0	98		21:00	20		19		0	0	39	
09:15	38		30		0	0	68		21:15	15		19		0	0	34	
09:30	47		30		0	0	77		21:30	17		16		0	0	33	
09:45	45	175	41	154	0	0	86	329	21:45	7	59	7	61	0	0	14	120
10:00	31		28		0	0	59		22:00	7		17		0	0	24	
10:15	34		25		0	0	59		22:15	6		12		0	0	18	
10:30	31		20		0	0	51		22:30	7		8		0	0	15	
10:45	24	120	19	92	0	0	43	212	22:45	5	25	9	46	0	0	14	71
11:00	50		43		0	0	93		23:00	4		9		0	0	13	
11:15	44		53		0	0	97		23:15	4		3		0	0	7	
11:30	76		43		0	0	119		23:30	2		7		0	0	9	
11:45	69	239	48	187	0	0	117	426	23:45	3	13	5	24	0	0	8	37
TOTALS		1161		945				**2106**	**TOTALS**		1831		2026				**3857**
SPLIT %		55.1%		44.9%				**35.3%**	**SPLIT %**		47.5%		52.5%				**64.7%**

DAILY TOTALS	NB	SB	EB	WB	Total
	2,992	2,971	0	0	5,963

AM Peak Hour	11:45	11:45			**11:45**	**PM Peak Hour**	12:00	16:45			**16:45**
AM Pk Volume	321	276			**597**	**PM Pk Volume**	311	328			**627**
Pk Hr Factor	0.863	0.885			**0.899**	**Pk Hr Factor**	0.836	0.678			**0.719**
7 - 9 Volume	470	371	0	0	**841**	**4 - 6 Volume**	517	560	0	0	**1077**
7 - 9 Peak Hour	08:00	07:45			**08:00**	**4 - 6 Peak Hour**	16:45	16:45			**16:45**
7 - 9 Pk Volume	293	228	0	0	**513**	**4 - 6 Pk Volume**	299	328	0	0	**627**
Pk Hr Factor	0.852	0.803	0.000	0.000	**0.903**	**Pk Hr Factor**	0.771	0.678	0.000	0.000	**0.719**

Prepared by NDS/ATD

DAILY TOTALS	NB	SB	EB	WB	To
	5,663	6,358	0	0	12,

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOT
00:00	5		9		0	0	14		12:00	106		167		0	0	273
00:15	1		2		0	0	3		12:15	114		123		0	0	237
00:30	1		4		0	0	5		12:30	126		128		0	0	254
00:45	3	10	3	18	0	0	6	28	12:45	156	502	101	519	0	0	257
01:00	5		6		0	0	11		13:00	158		104		0	0	262
01:15	2		3		0	0	5		13:15	98		73		0	0	171
01:30	0		1		0	0	1		13:30	92		97		0	0	189
01:45	0	7	1	11	0	0	1	18	13:45	99	447	76	350	0	0	175
02:00	2		2		0	0	4		14:00	86		85		0	0	171
02:15	2		3		0	0	5		14:15	64		84		0	0	148
02:30	0		4		0	0	4		14:30	68		101		0	0	169
02:45	1	5	4	13	0	0	5	18	14:45	69	287	100	370	0	0	169
03:00	0		5		0	0	5		15:00	65		124		0	0	189
03:15	3		2		0	0	5		15:15	72		125		0	0	197
03:30	2		3		0	0	5		15:30	86		129		0	0	215
03:45	4	9	0	10	0	0	4	19	15:45	64	287	115	493	0	0	179
04:00	1		4		0	0	5		16:00	91		181		0	0	272
04:15	2		2		0	0	4		16:15	51		156		0	0	207
04:30	10		15		0	0	25		16:30	58		223		0	0	281
04:45	21	34	12	33	0	0	33	67	16:45	80	280	195	755	0	0	275
05:00	16		13		0	0	29		17:00	93		297		0	0	390
05:15	25		17		0	0	42		17:15	84		226		0	0	310
05:30	23		18		0	0	41		17:30	89		232		0	0	321
05:45	75	139	25	73	0	0	100	212	17:45	78	344	184	939	0	0	262
06:00	49		28		0	0	77		18:00	82		169		0	0	251
06:15	48		35		0	0	83		18:15	61		135		0	0	196
06:30	67		38		0	0	105		18:30	74		113		0	0	187
06:45	90	254	46	147	0	0	136	401	18:45	57	274	105	522	0	0	162
07:00	81		37		0	0	118		19:00	45		72		0	0	117
07:15	147		31		0	0	178		19:15	40		76		0	0	116
07:30	148		61		0	0	209		19:30	41		72		0	0	113
07:45	204	580	63	192	0	0	267	772	19:45	29	155	68	288	0	0	97
08:00	185		69		0	0	254		20:00	46		50		0	0	96
08:15	224		70		0	0	294		20:15	29		54		0	0	83
08:30	182		64		0	0	246		20:30	34		52		0	0	86
08:45	169	760	70	273	0	0	239	1033	20:45	23	132	40	196	0	0	63
09:00	136		71		0	0	207		21:00	38		37		0	0	75
09:15	131		56		0	0	187		21:15	17		10		0	0	27
09:30	96		46		0	0	142		21:30	12		42		0	0	54
09:45	105	468	69	242	0	0	174	710	21:45	22	89	38	127	0	0	60
10:00	85		75		0	0	160		22:00	7		20		0	0	27
10:15	71		62		0	0	133		22:15	9		14		0	0	23
10:30	62		50		0	0	112		22:30	6		15		0	0	21
10:45	59	277	53	240	0	0	112	517	22:45	4	26	15	64	0	0	19
11:00	64		97		0	0	161		23:00	4		13		0	0	17
11:15	65		86		0	0	151		23:15	3		8		0	0	11
11:30	68		121		0	0	189		23:30	2		5		0	0	7
11:45	89	286	148	452	0	0	237	738	23:45	2	11	5	31	0	0	7
TOTALS		2829		1704				4533	TOTALS		2834		4654			
SPLIT %		62.4%		37.6%				37.7%	SPLIT %		37.8%		62.2%			

DAILY TOTALS	NB	SB	EB	WB	To
	5,663	6,358	0	0	12,

AM Peak Hour	07:45	11:45			07:45	PM Peak Hour	12:15	16:45		
AM Pk Volume	795	566			1061	PM Pk Volume	554	950		
Pk Hr Factor	0.887	0.847			0.902	Pk Hr Factor	0.877	0.800		
7 - 9 Volume	1340	465	0	0	1805	4 - 6 Volume	624	1694	0	0
7 - 9 Peak Hour	07:45	08:00			07:45	4 - 6 Peak Hour	16:45	16:45		
7 - 9 Pk Volume	795	273	0	0	1061	4 - 6 Pk Volume	346	950	0	0
Pk Hr Factor	0.887	0.975	0.000	0.000	0.902	Pk Hr Factor	0.930	0.800	0.000	0.000

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Commercentre Dr E/O Bake Pkwy

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_083

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,031	5,054	11,085

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00	0	0	2		5		7		12:00	0	0	79		84		163	
00:15	0	0	2		2		4		12:15	0	0	83		66		149	
00:30	0	0	4		6		10		12:30	0	0	90		96		186	
00:45	0	0	0	8	3	16	3	24	12:45	0	0	91	343	76	322	167	665
01:00	0	0	1		11		12		13:00	0	0	95		78		173	
01:15	0	0	4		3		7		13:15	0	0	89		63		152	
01:30	0	0	1		2		3		13:30	0	0	105		97		202	
01:45	0	0	1	7	2	18	3	25	13:45	0	0	99	388	58	296	157	684
02:00	0	0	1		1		2		14:00	0	0	59		92		151	
02:15	0	0	3		0		3		14:15	0	0	58		68		126	
02:30	0	0	1		1		2		14:30	0	0	64		110		174	
02:45	0	0	6	11	1	3	7	14	14:45	0	0	68	249	85	355	153	604
03:00	0	0	8		2		10		15:00	0	0	88		136		224	
03:15	0	0	2		3		5		15:15	0	0	66		111		177	
03:30	0	0	12		3		15		15:30	0	0	68		150		218	
03:45	0	0	11	33	2	10	13	43	15:45	0	0	55	277	122	519	177	796
04:00	0	0	14		4		18		16:00	0	0	58		200		258	
04:15	0	0	11		6		17		16:15	0	0	55		161		216	
04:30	0	0	26		4		30		16:30	0	0	54		219		273	
04:45	0	0	55	106	17	31	72	137	16:45	0	0	75	242	149	729	224	971
05:00	0	0	39		12		51		17:00	0	0	77		253		330	
05:15	0	0	49		13		62		17:15	0	0	81		190		271	
05:30	0	0	74		17		91		17:30	0	0	64		179		243	
05:45	0	0	126	288	17	59	143	347	17:45	0	0	68	290	142	764	210	1054
06:00	0	0	122		17		139		18:00	0	0	58		161		219	
06:15	0	0	113		18		131		18:15	0	0	62		102		164	
06:30	0	0	111		24		135		18:30	0	0	43		102		145	
06:45	0	0	178	524	25	84	203	608	18:45	0	0	31	194	51	416	82	610
07:00	0	0	159		29		188		19:00	0	0	31		58		89	
07:15	0	0	212		42		254		19:15	0	0	24		44		68	
07:30	0	0	180		57		237		19:30	0	0	26		38		64	
07:45	0	0	242	793	40	168	282	961	19:45	0	0	24	105	33	173	57	278
08:00	0	0	199		31		230		20:00	0	0	15		48		63	
08:15	0	0	205		49		254		20:15	0	0	15		13		28	
08:30	0	0	215		52		267		20:30	0	0	14		25		39	
08:45	0	0	195	814	54	186	249	1000	20:45	0	0	14	58	12	98	26	156
09:00	0	0	185		50		235		21:00	0	0	10		30		40	
09:15	0	0	129		51		180		21:15	0	0	12		14		26	
09:30	0	0	133		48		181		21:30	0	0	20		13		33	
09:45	0	0	143	590	40	189	183	779	21:45	0	0	15	57	10	67	25	124
10:00	0	0	105		42		147		22:00	0	0	10		15		25	
10:15	0	0	76		35		111		22:15	0	0	15		14		29	
10:30	0	0	71		44		115		22:30	0	0	12		18		30	
10:45	0	0	77	329	56	177	133	506	22:45	0	0	7	44	10	57	17	101
11:00	0	0	67		63		130		23:00	0	0	5		11		16	
11:15	0	0	64		53		117		23:15	0	0	6		4		10	
11:30	0	0	49		67		116		23:30	0	0	4		3		7	
11:45	0	0	82	262	110	293	192	555	23:45	0	0	4	19	6	24	10	43
TOTALS				3765		1234		4999	TOTALS				2266		3820		6086
SPLIT %				75.3%		24.7%		45.1%	SPLIT %				37.2%		62.8%		54.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,031	5,054	11,085

AM Peak Hour			07:45	11:45	07:45	PM Peak Hour			13:00	16:30	16:30
AM Pk Volume			861	356	1033	PM Pk Volume			388	811	1098
Pk Hr Factor			0.889	0.809	0.916	Pk Hr Factor			0.924	0.801	0.832
7 - 9 Volume	0	0	1607	354	1961	4 - 6 Volume	0	0	532	1493	2025
7 - 9 Peak Hour			07:45	08:00	07:45	4 - 6 Peak Hour			16:45	16:30	16:30
7 - 9 Pk Volume	0	0	861	186	1033	4 - 6 Pk Volume	0	0	297	811	1098
Pk Hr Factor	0.000	0.000	0.889	0.861	0.916	Pk Hr Factor	0.000	0.000	0.917	0.801	0.832

Prepared by NDS/ATD

Prepared by National Data & Surveying Services

VOLUME

Commercentre Dr S/O Dimension Dr

Day: Tuesday
Date: 4/24/2018

City: Lake Forest
Project #: CA18_1076_085

DAILY TOTALS	NB	SB	EB	WB	Total
	4,191	3,705	0	0	7,896

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	5		1		0	0	6		12:00	104		67		0	0	171	
00:15	2		2		0	0	4		12:15	58		77		0	0	135	
00:30	5		2		0	0	7		12:30	61		70		0	0	131	
00:45	0	12	3	8	0	0	3	20	12:45	58	281	66	280	0	0	124	561
01:00	2		4		0	0	6		13:00	58		92		0	0	150	
01:15	3		0		0	0	3		13:15	52		65		0	0	117	
01:30	0		1		0	0	1		13:30	49		53		0	0	102	
01:45	2	7	0	5	0	0	2	12	13:45	58	217	46	256	0	0	104	473
02:00	1		0		0	0	1		14:00	47		63		0	0	110	
02:15	1		0		0	0	1		14:15	57		40		0	0	97	
02:30	1		1		0	0	2		14:30	61		63		0	0	124	
02:45	2	5	0	1	0	0	2	6	14:45	62	227	45	211	0	0	107	438
03:00	4		1		0	0	5		15:00	84		54		0	0	138	
03:15	1		0		0	0	1		15:15	76		58		0	0	134	
03:30	5		3		0	0	8		15:30	79		65		0	0	144	
03:45	4	14	2	6	0	0	6	20	15:45	59	298	59	236	0	0	118	534
04:00	3		3		0	0	6		16:00	94		87		0	0	181	
04:15	4		0		0	0	4		16:15	80		60		0	0	140	
04:30	8		8		0	0	16		16:30	101		98		0	0	199	
04:45	11	26	15	26	0	0	26	52	16:45	103	378	75	320	0	0	178	698
05:00	15		6		0	0	21		17:00	193		99		0	0	292	
05:15	30		11		0	0	41		17:15	118		103		0	0	221	
05:30	19		26		0	0	45		17:30	101		92		0	0	193	
05:45	37	101	41	84	0	0	78	185	17:45	80	492	88	382	0	0	168	874
06:00	35		30		0	0	65		18:00	79		86		0	0	165	
06:15	52		35		0	0	87		18:15	58		71		0	0	129	
06:30	42		46		0	0	88		18:30	44		74		0	0	118	
06:45	58	187	57	168	0	0	115	355	18:45	40	221	34	265	0	0	74	486
07:00	52		56		0	0	108		19:00	31		43		0	0	74	
07:15	63		95		0	0	158		19:15	28		26		0	0	54	
07:30	70		96		0	0	166		19:30	31		29		0	0	60	
07:45	77	262	102	349	0	0	179	611	19:45	21	111	18	116	0	0	39	227
08:00	93		87		0	0	180		20:00	29		32		0	0	61	
08:15	72		94		0	0	166		20:15	16		10		0	0	26	
08:30	80		60		0	0	140		20:30	17		11		0	0	28	
08:45	124	369	67	308	0	0	191	677	20:45	10	72	7	60	0	0	17	132
09:00	96		65		0	0	161		21:00	9		25		0	0	34	
09:15	79		38		0	0	117		21:15	12		8		0	0	20	
09:30	66		53		0	0	119		21:30	13		4		0	0	17	
09:45	86	327	50	206	0	0	136	533	21:45	9	43	3	40	0	0	12	83
10:00	57		40		0	0	97		22:00	11		7		0	0	18	
10:15	55		38		0	0	93		22:15	9		6		0	0	15	
10:30	52		31		0	0	83		22:30	14		2		0	0	16	
10:45	52	216	38	147	0	0	90	363	22:45	5	39	1	16	0	0	6	55
11:00	53		38		0	0	91		23:00	6		6		0	0	12	
11:15	64		43		0	0	107		23:15	6		4		0	0	10	
11:30	62		44		0	0	106		23:30	5		2		0	0	7	
11:45	85	264	71	196	0	0	156	460	23:45	5	22	7	19	0	0	12	41
TOTALS		1790		1504				**3294**	**TOTALS**		2401		2201				**4602**
SPLIT %		54.3%		45.7%				**41.7%**	**SPLIT %**		52.2%		47.8%				**58.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	4,191	3,705	0	0	7,896

AM Peak Hour	08:30	07:15			**07:30**	**PM Peak Hour**	16:30	17:00			**16:30**
AM Pk Volume	379	380			**691**	**PM Pk Volume**	515	382			**890**
Pk Hr Factor	0.764	0.931			**0.960**	**Pk Hr Factor**	0.667	0.927			**0.762**
7 - 9 Volume	631	657	0	0	**1288**	**4 - 6 Volume**	870	702	0	0	**1572**
7 - 9 Peak Hour	08:00	07:15			**07:30**	**4 - 6 Peak Hour**	16:30	17:00			**16:30**
7 - 9 Pk Volume	369	380	0	0	**691**	**4 - 6 Pk Volume**	515	382	0	0	**890**
Pk Hr Factor	0.744	0.931	0.000	0.000	**0.960**	**Pk Hr Factor**	0.667	0.927	0.000	0.000	**0.762**

Prepared by National Data & Surveying Services

Alton Pkwy & Portola Pkwy

Peak Hour Turning Movement Count

ID: 18-01075-001
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Alton Pkwy — SOUTHBOUND

AM	3	160	187	0	116	AM
NOON	0	0	0	0	0	NOON
PM	3	58	111	0	339	PM

Portola Pkwy — EASTBOUND

AM	NOON	PM	
134	0	285	⇦
0	0	0	0
3	0	1	2
280	0	129	2
133	0	52	1

Portola Pkwy — WESTBOUND

PM	NOON	AM	
1	173	0	88
3	176	0	97
2	307	0	538
0	0	0	0
⇨	723	0	774

Alton Pkwy — NORTHBOUND

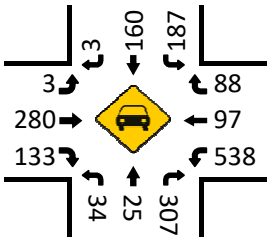
PM	418	1	106	165	483	PM
NOON	0	0	0	0	0	NOON
AM	832	1	34	25	307	AM

Turning movements (left, through, right, U-turn):

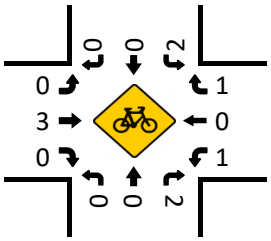
0	2	1	0
0	1	2	1

CONTROL			
Signalized			
TEV	1856	0	1765
	AM	NOON	PM
PHF	0.96		0.95

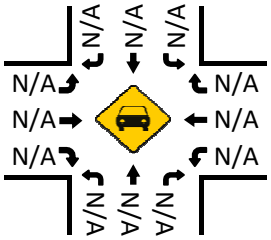
Total Vehicles (AM)



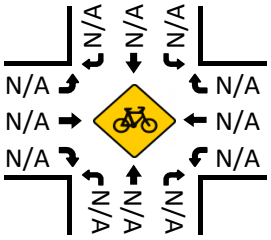
Bikes (AM)



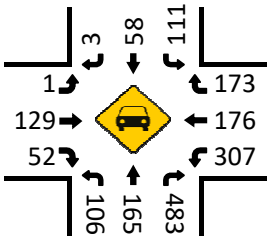
Total Vehicles (Noon)



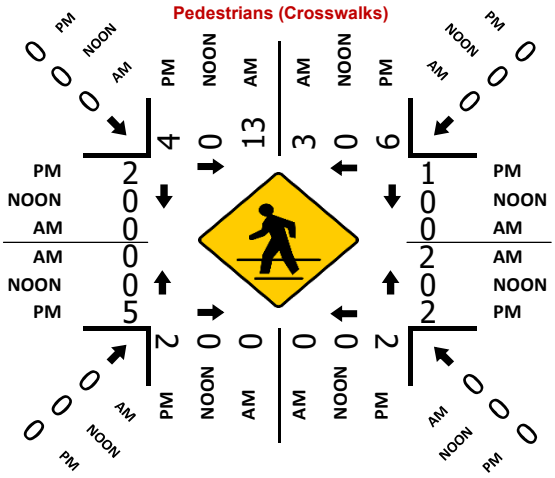
Bikes (NOON)



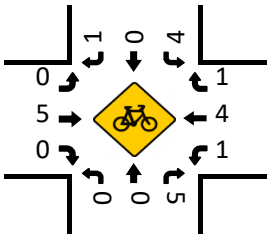
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Bake Pkwy & Portola Pkwy

Peak Hour Turning Movement Count

ID: 18-01075-002
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Bake Pkwy — SOUTHBOUND

AM	282	382	119	10	554	AM
NOON	0	0	0	0	0	NOON
PM	194	223	148	38	630	PM
	0	2	1	0		

Portola Pkwy — EASTBOUND

AM	NOON	PM	
860	0	949	
0	0	17	0
290	0	271	1
355	0	614	3
91	0	71	0

Portola Pkwy — WESTBOUND

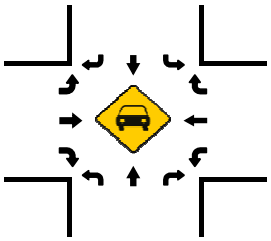
PM	NOON	AM	
44	0	64	0
552	0	532	2
245	0	368	2
2	0	0	0
1083	0	583	

Bake Pkwy — NORTHBOUND

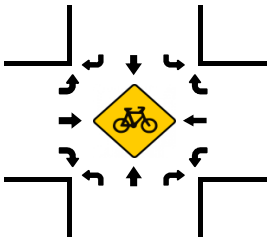
PM	540	1	186	277	319	PM
NOON	0	0	0	0	0	NOON
AM	842	1	46	190	109	AM
		0	1	1.5	1.5	

CONTROL			
Signalized			
TEV	2839	0	3202
	AM	NOON	PM
PHF	0.92		0.96

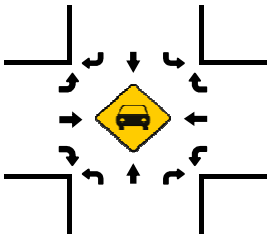
Total Vehicles (AM)



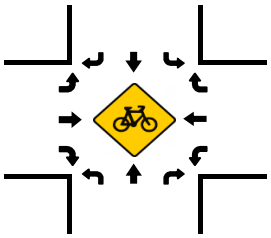
Bikes (AM)



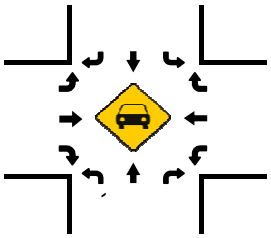
Total Vehicles (Noon)



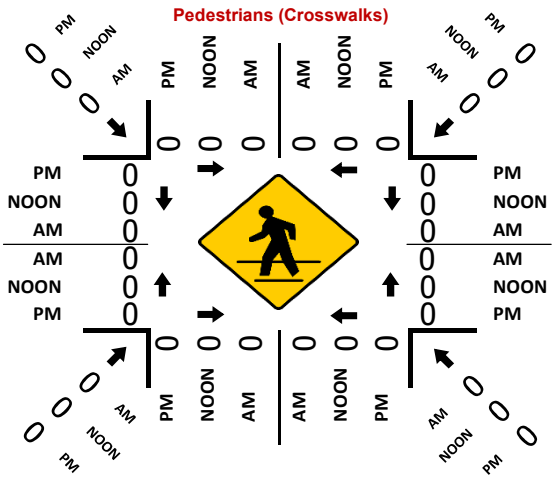
Bikes (NOON)



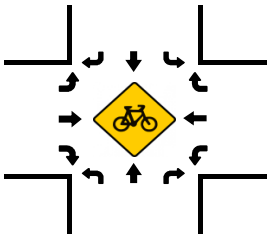
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Lake Forest Dr & Portola Pkwy

Peak Hour Turning Movement Count

ID: 18-01075-003
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	4	177	191	0	420	AM
NOON	0	0	0	0	0	NOON
PM	29	176	150	1	345	PM
	0	2	1	0		

Portola Pkwy — EASTBOUND

AM	NOON	PM	
952	0	871	
1	0	3	0
21	0	19	2
531	0	1003	3
56	0	63	0
AM	NOON	PM	

Portola Pkwy — WESTBOUND

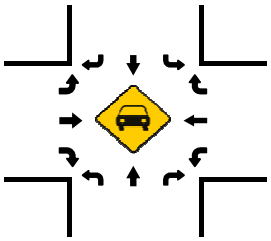
PM	NOON	AM	
172	0	247	0
753	0	916	3
160	0	235	2
2	0	0	0
1343	0	850	
PM	NOON	AM	

Lake Forest Dr — NORTHBOUND

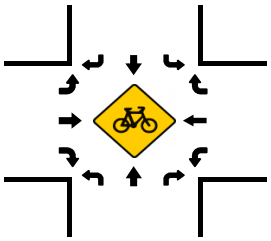
PM	399	0	86	153	188	PM
NOON	0	0	0	0	0	NOON
AM	469	1	31	152	128	AM
		0	1	2	0	

CONTROL			
Signalized			
TEV	2691	0	2958
	AM	NOON	PM
PHF	0.84		0.93

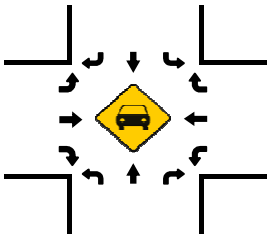
Total Vehicles (AM)



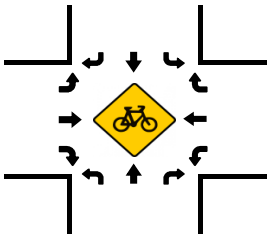
Bikes (AM)



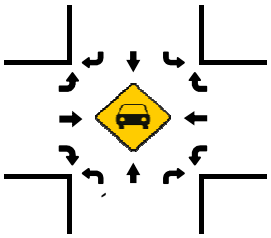
Total Vehicles (Noon)



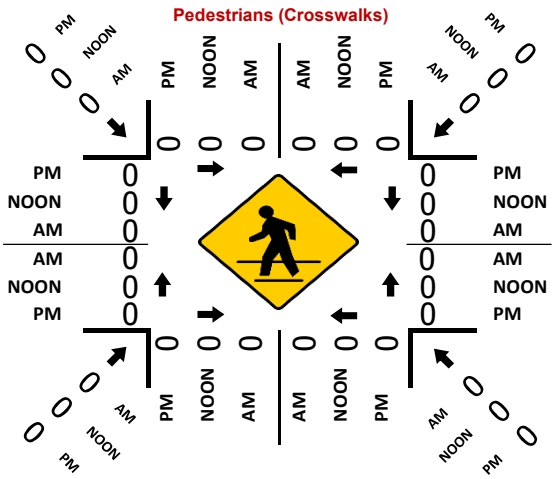
Bikes (NOON)



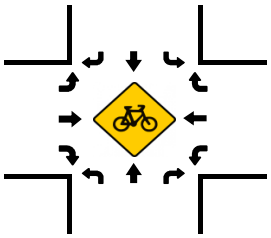
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Glenn Ranch Rd & Portola Pkwy

Peak Hour Turning Movement Count

ID: 18-01075-004
City: Lake Forest

Day: Tuesday
Date: 04/17/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SOUTHBOUND — Glenn Ranch Rd

AM	702	70	300	0	535
NOON	0	0	0	0	0
PM	350	37	239	0	1106

EASTBOUND — Portola Pkwy

AM	NOON	PM	
1763	0	1049	⇦
2	0	3	0
250	0	803	2
491	0	1027	3
105	0	96	1

WESTBOUND — Portola Pkwy

	PM	NOON	AM
1	264	0	261
3	586	0	985
2	60	0	125
0	12	0	5
⇨	1364	0	866

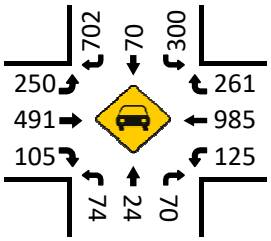
NORTHBOUND — Glenn Ranch Rd

PM	193	0	110	39	86
NOON	0	0	0	0	0
AM	300	0	74	24	70

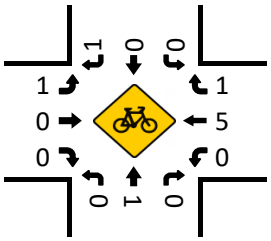
Turning movements (AM): 1 2 2 0 — 0 1 2 0

CONTROL			
Signalized			
TEV	3464	0	3712
	AM	NOON	PM
PHF	0.88		0.96

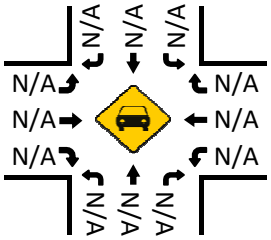
Total Vehicles (AM)



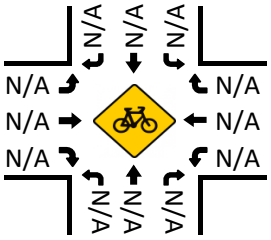
Bikes (AM)



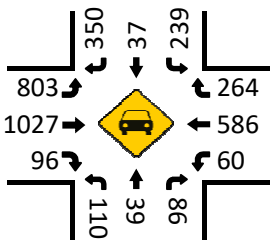
Total Vehicles (Noon)



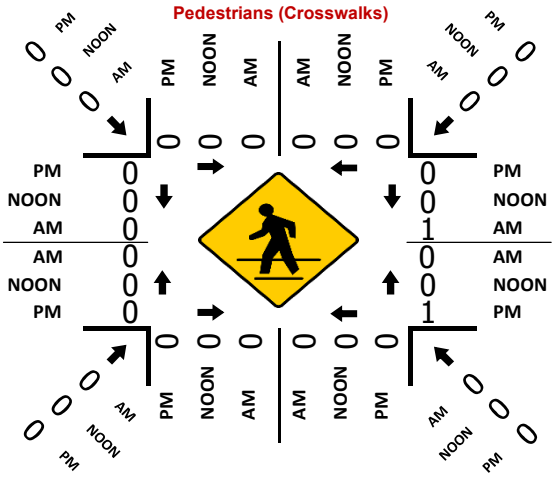
Bikes (NOON)



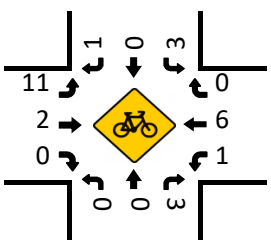
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Portola Pkwy & SR-241 Ramps

Peak Hour Turning Movement Count

ID: 18-01075-005
City: Lake Forest

Day: Tuesday
Date: 04/17/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SOUTHBOUND — Portola Pkwy

AM	197	564	121	2	1384
NOON	0	0	0	0	0
PM	114	1028	297	1	930
	1	3	2	0	

EASTBOUND — SR-241 Ramps

AM	NOON	PM	
569	0	253	
0	0	0	0
102	0	113	1
0	0	0	0
150	0	324	1

WESTBOUND — SR-241 Ramps

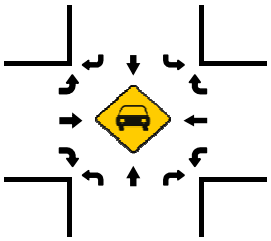
PM	NOON	AM	
146	0	319	1
0	0	0	0
100	0	150	2
0	0	1	0
484	0	188	

NORTHBOUND — Portola Pkwy

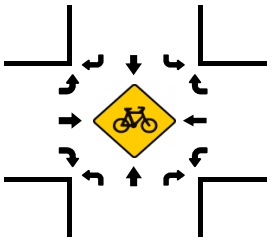
PM	1453	1	139	670	187
NOON	0	0	0	0	0
AM	864	0	372	961	66
		0	2	3	1

CONTROL			
Signalized			
TEV	3005	0	3120
	AM	NOON	PM
PHF	0.86		0.95

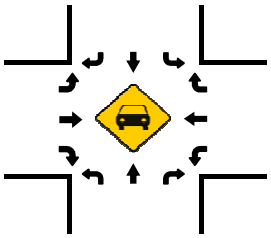
Total Vehicles (AM)



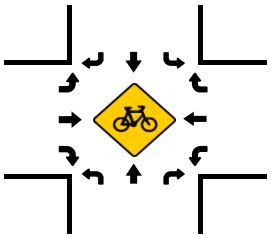
Bikes (AM)



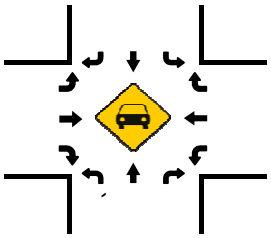
Total Vehicles (Noon)



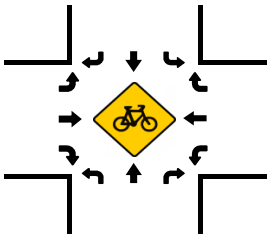
Bikes (NOON)



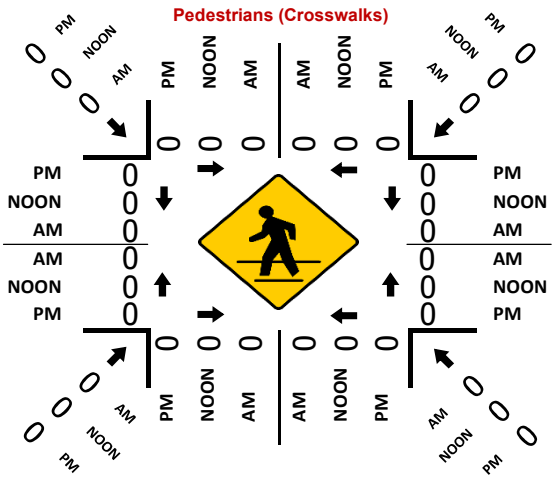
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Alton Pkwy & SR-241 Ramps

Peak Hour Turning Movement Count

ID: 18-01075-006
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Alton Pkwy — SOUTHBOUND

AM	280	666	51	1	648	AM
NOON	0	0	0	0	0	NOON
PM	228	451	71	8	1081	PM
	0.5	1.5	1	0		

SR-241 Ramps — EASTBOUND

AM	NOON	PM	
402	0	476	
1	0	0	0
183	0	236	2
0	0	0	0
469	0	117	1
AM	NOON	PM	

SR-241 Ramps — WESTBOUND

	PM	NOON	AM
1	74	0	67
0	0	0	0
2	46	0	333
0	0	0	0
	298	0	133
	PM	NOON	AM

CONTROL

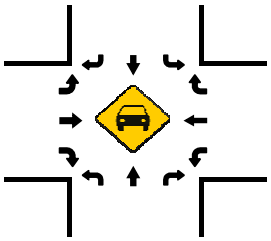
Signalized

	AM	NOON	PM
TEV	2653	0	2470
PHF	0.90		0.90

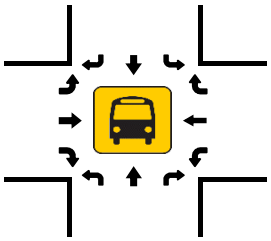
Alton Pkwy — NORTHBOUND

	0	1	2.5	0.5		
PM	615	1	248	763	227	PM
NOON	0	0	0	0	0	NOON
AM	1470	2	121	397	82	AM

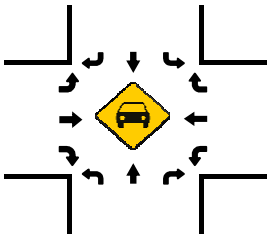
Total Vehicles (AM)



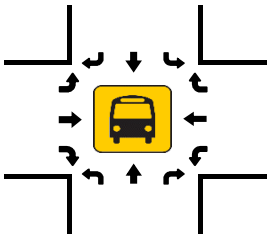
Total Vehicles (AM)



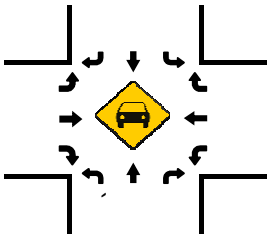
Total Vehicles (NOON)



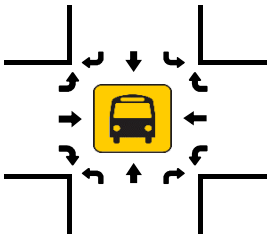
Total Vehicles (NOON)



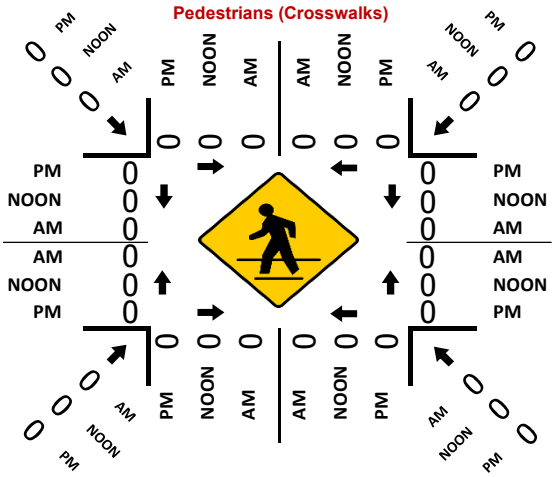
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Lake Forest Dr & SR-241 NB Ramp

Peak Hour Turning Movement Count

ID: 18-01075-007
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	107	451	0	0	621	AM
NOON	0	0	0	0	0	NOON
PM	166	575	0	0	671	PM
	1	2	0	0		

SR-241 NB Ramp — EASTBOUND

AM	NOON	PM	
262	0	317	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

SR-241 NB Ramp — WESTBOUND

PM	NOON	AM	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	
PM	NOON	AM	

CONTROL

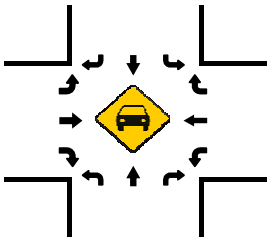
Signalized

TEV	1334	0	1563
	AM	NOON	PM
PHF	0.87		0.92

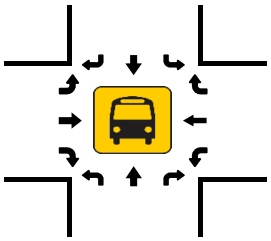
Lake Forest Dr — NORTHBOUND

PM	575	0	151	671	0	PM
NOON	0	0	0	0	0	NOON
AM	451	0	155	621	0	AM
		0	2	2	0	

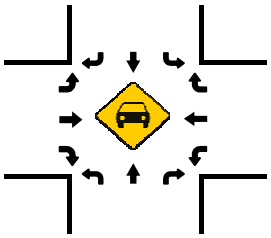
Total Vehicles (AM)



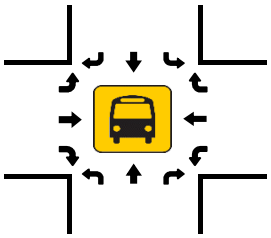
Total Vehicles (AM)



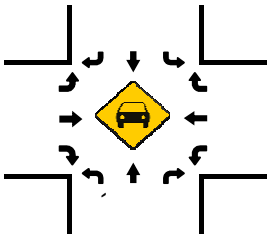
Total Vehicles (NOON)



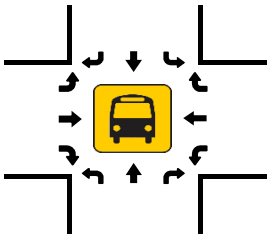
Total Vehicles (NOON)



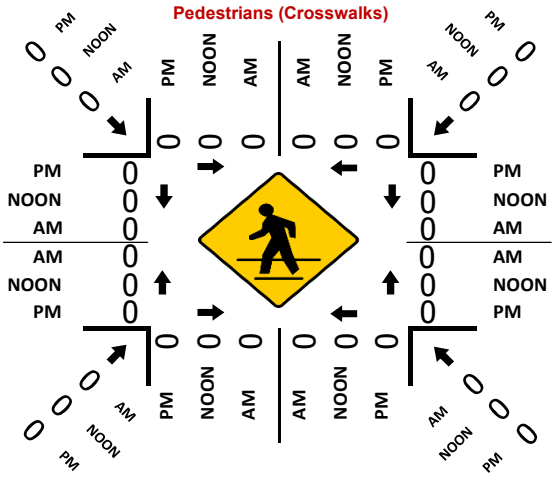
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Lake Forest Dr & SR-241 SB Ramp

Peak Hour Turning Movement Count

ID: 18-01075-008
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS		COUNT PERIODS
	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
	NONE	NONE
	04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	0	448	0	0	768	AM
NOON	0	0	0	0	0	NOON
PM	0	575	0	0	838	PM

SR-241 SB Ramp — EASTBOUND

AM	NOON	PM	
0	0	0	
0	0	0	0
168	0	73	2
0	0	0	0
170	0	168	1
AM	NOON	PM	

SR-241 SB Ramp — WESTBOUND

PM	NOON	AM	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	
PM	NOON	AM	

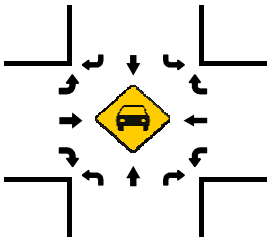
0	2	0	0	
0	0	2	0	

Lake Forest Dr — NORTHBOUND

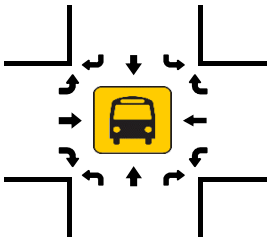
PM	743	0	0	765	0	PM
NOON	0	0	0	0	0	NOON
AM	618	0	0	600	0	AM

CONTROL			
Signalized			
TEV	1386	0	1581
	AM	NOON	PM
PHF	0.85		0.96

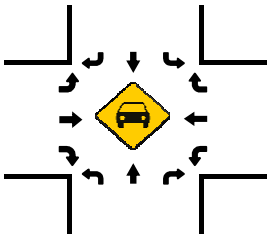
Total Vehicles (AM)



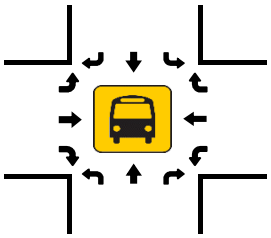
Total Vehicles (AM)



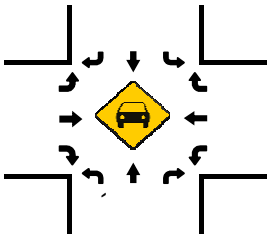
Total Vehicles (NOON)



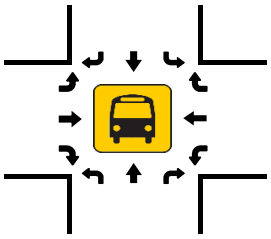
Total Vehicles (NOON)



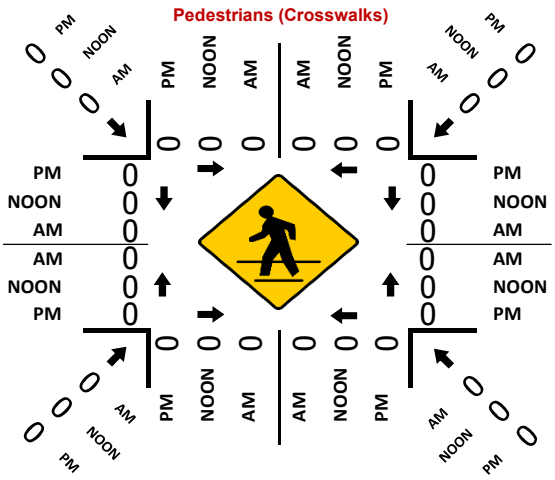
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Bake Pkwy & Rancho Pkwy

Peak Hour Turning Movement Count

ID: 18-01075-009
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Bake Pkwy — SOUTHBOUND

AM	0	891	89	9	714	AM
NOON	0	0	0	0	0	NOON
PM	0	670	246	24	1250	PM

Rancho Pkwy — EASTBOUND

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

Rancho Pkwy — WESTBOUND

	PM	NOON	AM
2	209	0	121
0	0	0	0
2	276	0	531
0	0	0	0
	833	0	314
	PM	NOON	AM

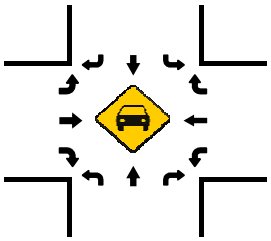
0	2	1	0	
0	0	2	0	

CONTROL			
Signalized			
TEV	2450	0	3029
	AM	NOON	PM
PHF	0.95		0.93

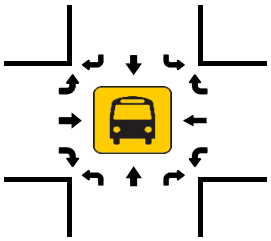
Bake Pkwy — NORTHBOUND

PM	946	0	0	1017	587	PM
NOON	0	0	0	0	0	NOON
AM	1422	0	0	584	225	AM

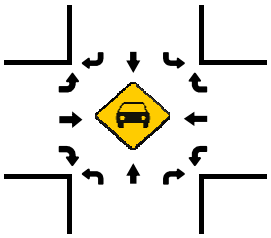
Total Vehicles (AM)



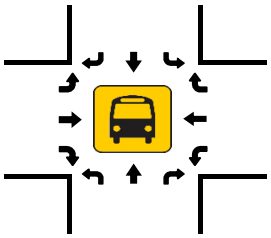
Total Vehicles (AM)



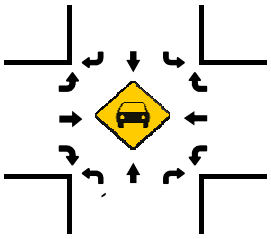
Total Vehicles (NOON)



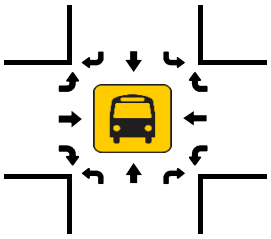
Total Vehicles (NOON)



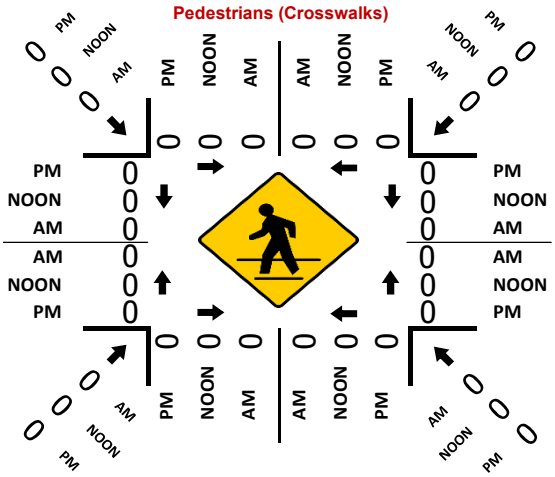
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Lake Forest Dr & Rancho Pkwy

Peak Hour Turning Movement Count

ID: 18-01075-010
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	44	487	104	16	599	AM
NOON	0	0	0	0	0	NOON
PM	49	602	116	27	766	PM
	0	2	1	0		

Rancho Pkwy — EASTBOUND

AM	NOON	PM	
725	0	554	
0	0	4	0
18	0	34	1
190	0	604	2
49	0	137	0
AM	NOON	PM	

Rancho Pkwy — WESTBOUND

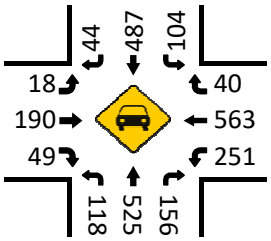
PM	NOON	AM	
74	0	40	1
339	0	563	2
144	0	251	2
3	0	0	0
1042	0	450	
PM	NOON	AM	

Lake Forest Dr — NORTHBOUND

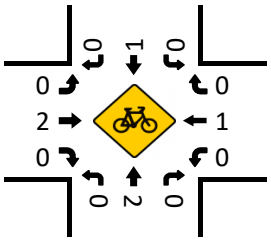
PM	892	9	162	631	319	PM
NOON	0	0	0	0	0	NOON
AM	793	6	118	525	156	AM
		0	1	2	0	

CONTROL			
Signalized			
TEV	2567	0	3254
	AM	NOON	PM
PHF	0.90		0.89

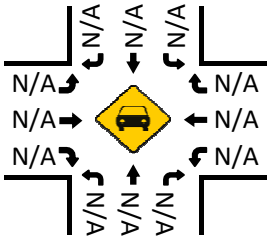
Total Vehicles (AM)



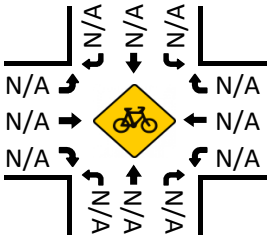
Bikes (AM)



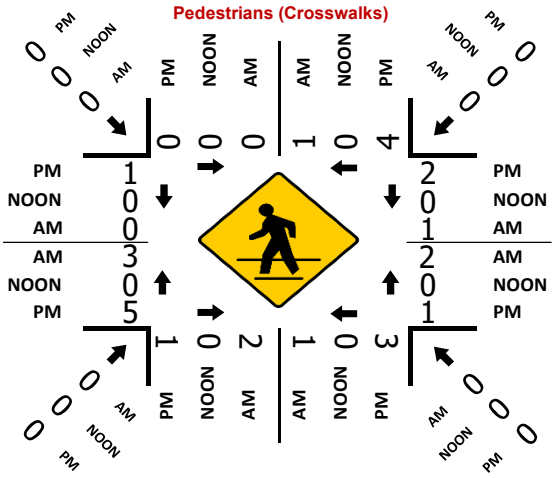
Total Vehicles (Noon)



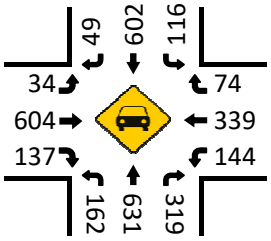
Bikes (NOON)



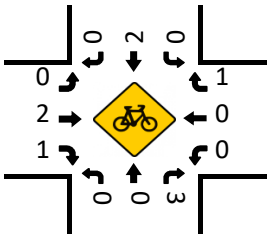
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Bake Pkwy & Rancho Pkwy S

Peak Hour Turning Movement Count

ID: 18-01075-011
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Bake Pkwy — SOUTHBOUND

AM	302	1112	0	0	801
NOON	0	0	0	0	0
PM	130	851	0	0	1621
	1	2	0	0	

Rancho Pkwy S — EASTBOUND

AM	NOON	PM	
537	0	276	
1	0	0	0
118	0	257	2
0	0	0	0
139	0	176	1

Rancho Pkwy S — WESTBOUND

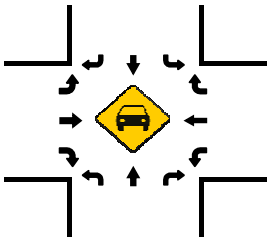
PM	NOON	AM	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	

Bake Pkwy — NORTHBOUND

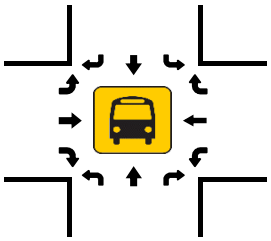
PM	1031	4	146	1364	0
NOON	0	0	0	0	0
AM	1254	3	234	683	0
		0	1	2	0

CONTROL			
Signalized			
TEV	2592	0	2928
	AM	NOON	PM
PHF	0.94		0.91

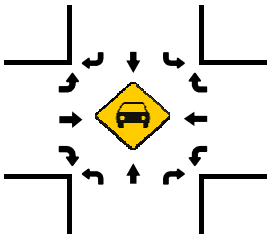
Total Vehicles (AM)



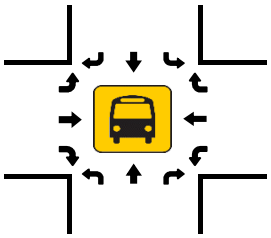
Total Vehicles (AM)



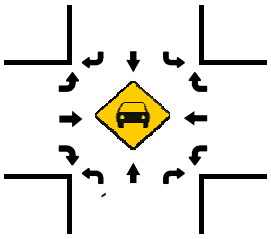
Total Vehicles (NOON)



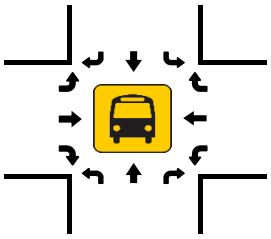
Total Vehicles (NOON)



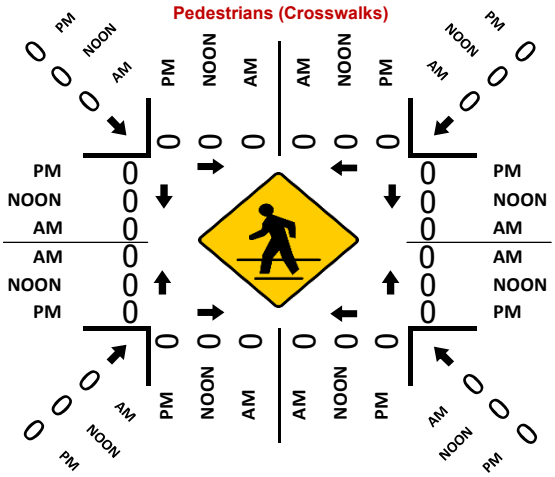
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

El Toro Rd & Portola Pkwy/Santa Margarita Pky

Peak Hour Turning Movement Count

ID: 18-01075-012
City: Lake Forest

Day: Tuesday
Date: 04/17/2018

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM		07:00 AM - 09:00 AM
NONE		NONE
05:00 PM - 06:00 PM		04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	375	596	30	0	283	AM
NOON	0	0	0	0	0	NOON
PM	161	201	12	0	872	PM
	1	3	1	0		

Portola Pkwy/Santa Margarita Pkwy — EASTBOUND

AM	NOON	PM	
2252	0	1252	
5	0	6	0
68	0	322	2
609	0	1634	3
220	0	434	1
AM	NOON	PM	

Portola Pkwy/Santa Margarita Pkwy — WESTBOUND

PM	NOON	AM	
52	0	35	0
827	0	1551	4
384	0	436	2
2	0	4	0
2220	0	1093	
PM	NOON	AM	

CONTROL

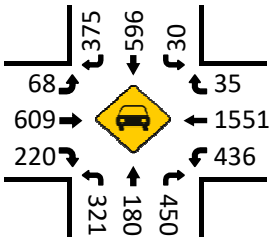
Signalized

TEV	4880	0	5363
	AM	NOON	PM
PHF	0.90		0.89

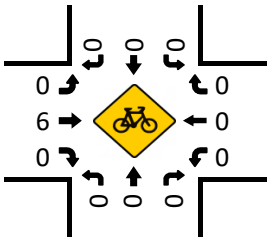
El Toro Rd — NORTHBOUND

PM	1019	0	258	498	572	PM
NOON	0	0	0	0	0	NOON
AM	1252	0	321	180	450	AM
		0	1	3	1	

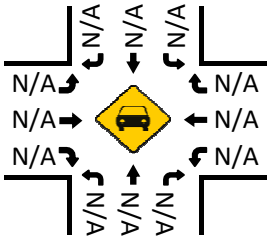
Total Vehicles (AM)



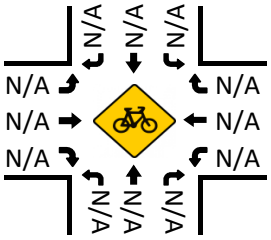
Bikes (AM)



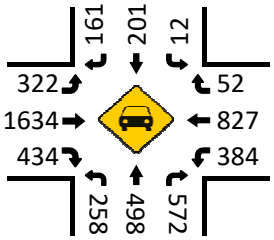
Total Vehicles (Noon)



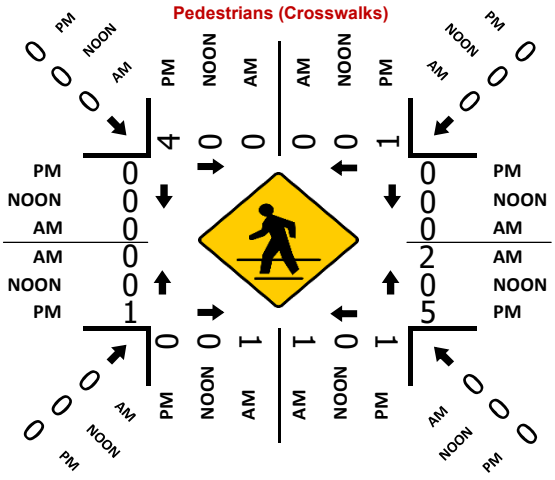
Bikes (NOON)



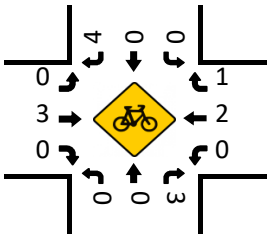
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Bake Pkwy & Commercentre Dr

Peak Hour Turning Movement Count

ID: 18-01075-013
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Bake Pkwy — SOUTHBOUND

AM	111	960	34	0	916	AM
NOON	0	0	0	0	0	NOON
PM	149	835	10	2	1320	PM

Commercentre Dr — EASTBOUND

AM	NOON	PM	
250	0	577	
0	0	0	0
94	0	96	1
288	0	93	2
62	0	56	0
AM	NOON	PM	

Commercentre Dr — WESTBOUND

PM	NOON	AM	
28	0	3	0
362	0	73	1
435	0	114	2
0	0	0	0
254	0	817	
PM	NOON	AM	

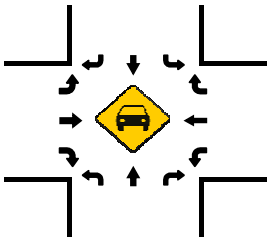
Bake Pkwy — NORTHBOUND

PM	1326	0	66	1194	151	PM
NOON	0	0	0	0	0	NOON
AM	1136	0	66	819	495	AM

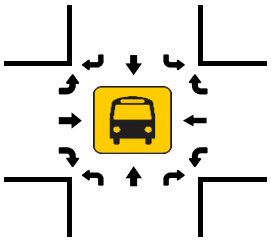
Turning movements (left, through, right, U-turn): 0 2 1 0 (SB); 0 1 2 0 (NB)

CONTROL			
Signalized			
TEV	3119	0	3477
	AM	NOON	PM
PHF	0.95		0.91

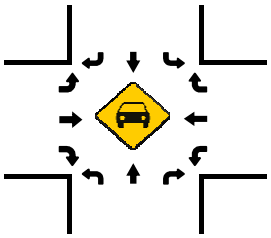
Total Vehicles (AM)



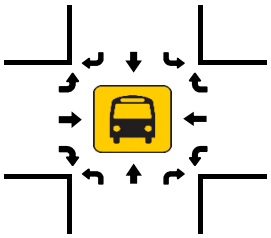
Total Vehicles (AM)



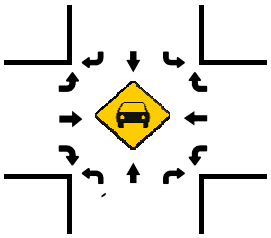
Total Vehicles (NOON)



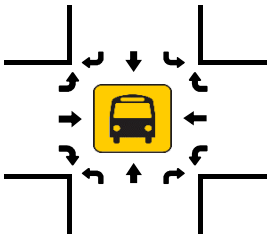
Total Vehicles (NOON)



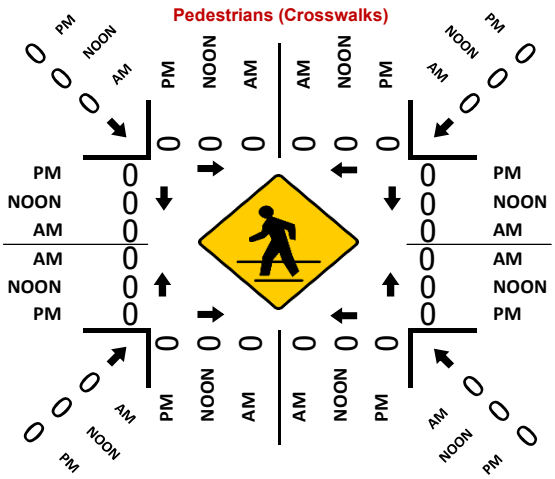
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Bake Pkwy & Trabuco Rd/Irvine Blvd

Peak Hour Turning Movement Count

ID: 18-01075-014
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SOUTHBOUND — Bake Pkwy

AM	86	930	56	7	1929	AM
NOON	0	0	0	0	0	NOON
PM	127	1353	210	9	1481	PM
	1	3	2	0		

EASTBOUND — Trabuco Rd/Irvine Blvd

AM	NOON	PM	
849	0	590	
3	0	0	0
135	0	107	2
206	0	544	3
213	0	264	1
AM	NOON	PM	

WESTBOUND — Trabuco Rd/Irvine Blvd

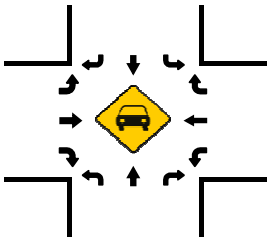
PM	NOON	AM	
100	0	155	1
279	0	543	3
228	0	633	2
81	0	35	0
1420	0	417	
PM	NOON	AM	

NORTHBOUND — Bake Pkwy

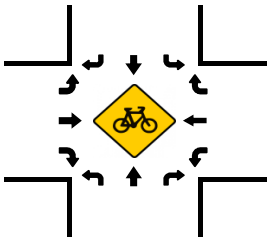
PM	1851	6	184	1265	585	PM
NOON	0	0	0	0	0	NOON
AM	1777	1	217	1632	120	AM
		0	1	3	0	

CONTROL			
Signalized			
TEV	4972	0	5342
	AM	NOON	PM
PHF	0.93		0.93

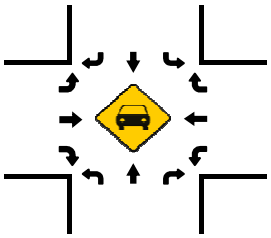
Total Vehicles (AM)



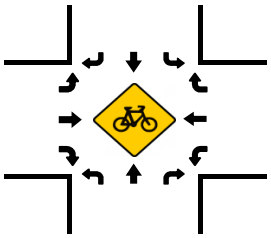
Bikes (AM)



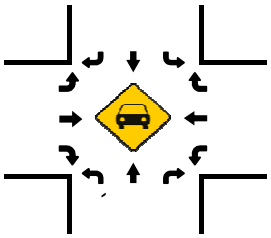
Total Vehicles (Noon)



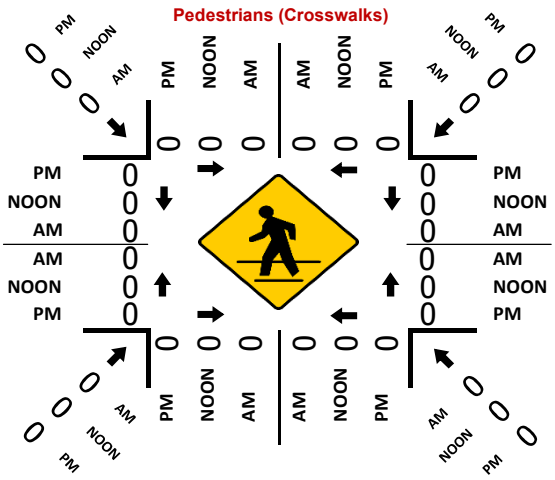
Bikes (NOON)



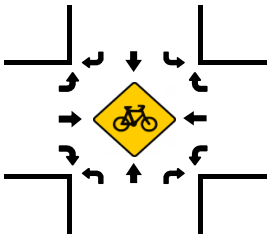
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Lake Forest Dr & Trabuco Rd

Peak Hour Turning Movement Count

ID: 18-01075-015
City: Lake Forest

Day: Thursday
Date: 04/19/2018

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

	Right	Thru	Left	U-Turn	Approach total
Lanes	0	3	2	0	
AM	138	1105	209	1	1263
NOON	0	0	0	0	0
PM	126	1015	331	5	1670

Trabuco Rd — EASTBOUND

	U-Turn	Left	Thru	Right	Departing total
Lanes	0	2	3	1	
AM	22	112	481	258	1050
NOON	0	0	0	0	0
PM	71	269	780	170	917

Trabuco Rd — WESTBOUND

	Right	Thru	Left	U-Turn	Departing total
Lanes	1	3	2	0	
PM	293	474	185	11	1567
NOON	0	0	0	0	0
AM	370	724	433	26	845

Lake Forest Dr — NORTHBOUND

	Departing total	U-Turn	Left	Thru	Right
Lanes		0	2	3	1
PM	1379	9	246	1103	445
NOON	0	0	0	0	0
AM	1809	13	166	780	129

CONTROL

Signalized

	AM	NOON	PM
TEV	4967	0	5533
PHF	0.86		0.97

Total Vehicles (AM)

Approach	Left	Thru	Right
Southbound	209	1105	138
Eastbound	112	481	258
Westbound	433	724	370
Northbound	166	780	129

Total Vehicles (Noon)

Approach	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Total Vehicles (PM)

Approach	Left	Thru	Right
Southbound	331	1015	126
Eastbound	269	780	170
Westbound	185	474	293
Northbound	246	110	445

Bikes (AM)

Approach	Left	Thru	Right
Southbound	1	2	0
Eastbound	0	0	0
Westbound	1	2	0
Northbound	5	0	0

Bikes (NOON)

Approach	Left	Thru	Right
Southbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Bikes (PM)

Approach	Left	Thru	Right
Southbound	1	0	0
Eastbound	0	2	0
Westbound	0	2	1
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North leg	Eastbound (→)	0	0	0
North leg	Westbound (←)	0	0	2
West leg	Southbound (↓)	5	0	4
West leg	Northbound (↑)	3	0	2
East leg	Southbound (↓)	2	0	27
East leg	Northbound (↑)	1	0	0
South leg	Eastbound (→)	2	0	0
South leg	Westbound (←)	0	0	28
NW diagonal		0	0	0
NE diagonal		0	0	0
SW diagonal		0	0	0
SE diagonal		0	0	0

Prepared by National Data & Surveying Services

Ridge Route Dr & Trabuco Rd

Peak Hour Turning Movement Count

ID: 18-01075-016
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Ridge Route Dr — SOUTHBOUND

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	0	PM

Trabuco Rd — EASTBOUND

AM	NOON	PM	
1578	0	910	⇦
0	0	0	↶ 0
0	0	0	↱ 0
629	0	1489	→ 3
191	0	117	↳ 0
AM	NOON	PM	

Trabuco Rd — WESTBOUND

PM	NOON	AM	
0	0	0	0 ↰
762	0	1390	3 ←
98	0	164	1 ↲
24	0	7	0 ↶
1738	0	852	⇨
PM	NOON	AM	

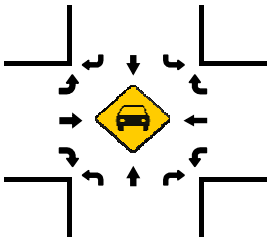
0	0	0	0	⇩
0	1	0	1	

Ridge Route Dr — NORTHBOUND

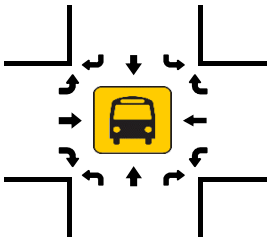
PM	215	0	148	0	225	PM
NOON	0	0	0	0	0	NOON
AM	355	0	188	0	216	AM

CONTROL			
Signalized			
TEV	2785	0	2863
	AM	NOON	PM
PHF	0.80		0.93

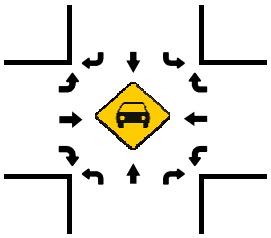
Total Vehicles (AM)



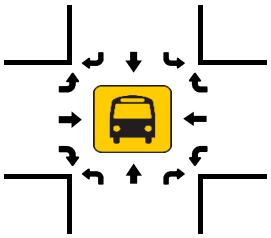
Total Vehicles (AM)



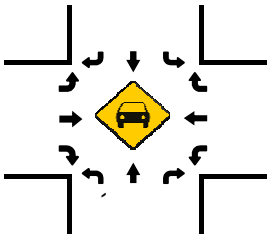
Total Vehicles (NOON)



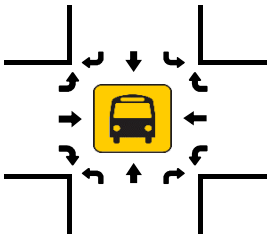
Total Vehicles (NOON)



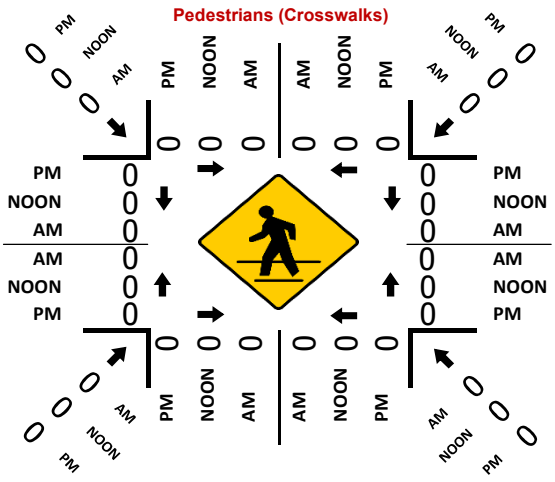
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

El Toro Rd & Trabuco Rd

Peak Hour Turning Movement Count

ID: 18-01075-017
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	275	1495	250	1	1073	AM
NOON	0	0	0	0	0	NOON
PM	152	873	236	9	1709	PM
	1	3	2	0		

Trabuco Rd — EASTBOUND

AM	NOON	PM	
1303	0	858	
0	0	0	0
194	0	381	2
374	0	874	3
185	0	235	0
AM	NOON	PM	

Trabuco Rd — WESTBOUND

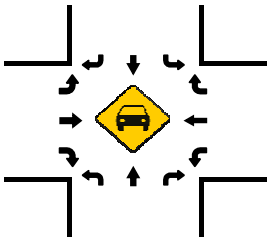
PM	NOON	AM	
210	0	204	1
404	0	832	3
128	0	287	2
0	0	0	0
1442	0	797	
PM	NOON	AM	

El Toro Rd — NORTHBOUND

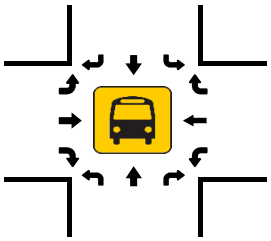
	0	2	3	1		
PM	1238	2	302	1109	332	PM
NOON	0	0	0	0	0	NOON
AM	1968	1	196	674	173	AM

CONTROL			
Signalized			
TEV	5141	0	5247
	AM	NOON	PM
PHF	0.87		0.95

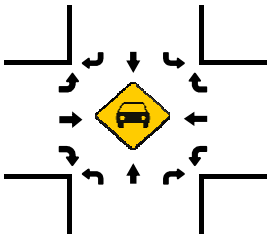
Total Vehicles (AM)



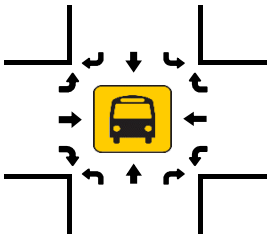
Total Vehicles (AM)



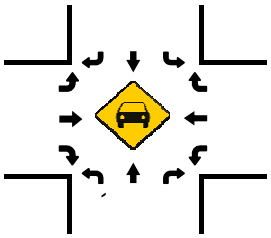
Total Vehicles (NOON)



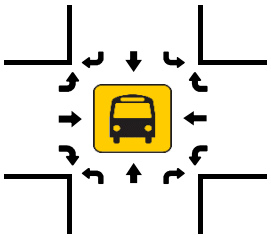
Total Vehicles (NOON)



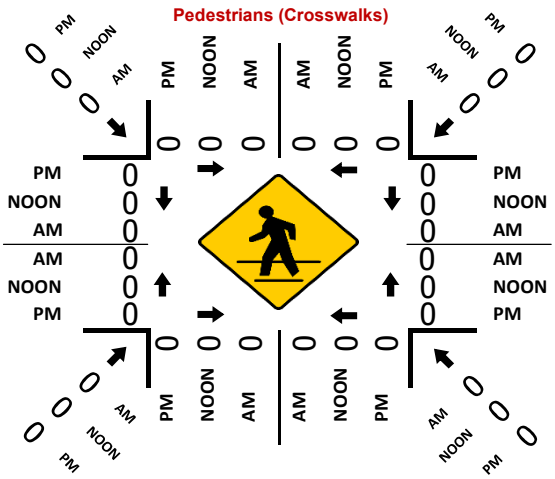
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Bake Pkwy & Toledo Way

Peak Hour Turning Movement Count

ID: 18-01075-018
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Bake Pkwy — SOUTHBOUND

AM	141	1685	65	0	2052	AM
NOON	0	0	0	0	0	NOON
PM	32	1874	71	0	2053	PM
	0	3	1	0		

Toledo Way — EASTBOUND

AM	NOON	PM	
622	0	130	
0	0	0	0
32	0	121	2
36	0	265	2
38	0	283	1
AM	NOON	PM	

Toledo Way — WESTBOUND

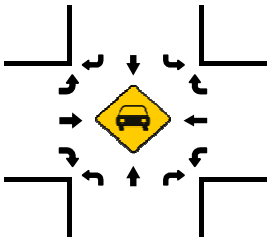
	PM	NOON	AM
0	70	0	85
2	52	0	185
1	50	0	273
0	1	0	0
	652	0	152
	PM	NOON	AM

Bake Pkwy — NORTHBOUND

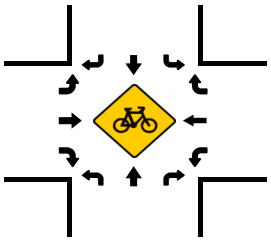
PM	2208	1	46	1862	315	PM
NOON	0	0	0	0	0	NOON
AM	1998	2	296	1935	51	AM
		0	1	3	0	

CONTROL			
Signalized			
TEV	4824	0	5043
	AM	NOON	PM
PHF	0.90		0.91

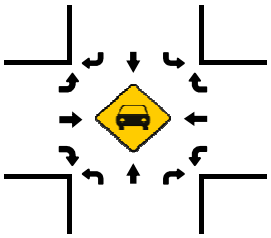
Total Vehicles (AM)



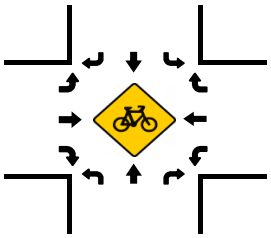
Bikes (AM)



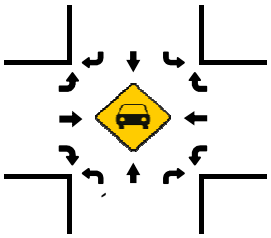
Total Vehicles (Noon)



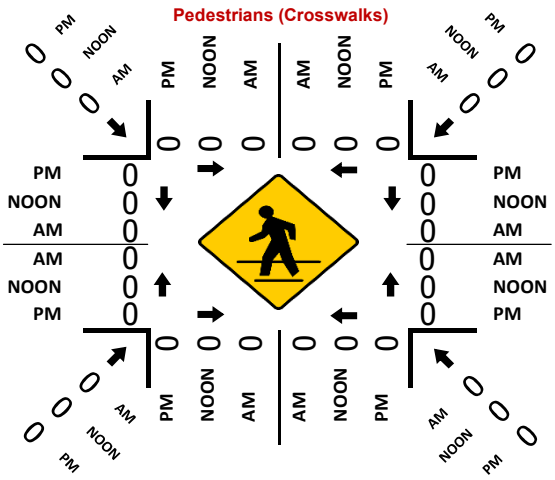
Bikes (NOON)



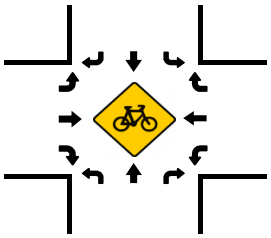
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Lake Forest Dr & Toledo Way

Peak Hour Turning Movement Count

ID: 18-01075-019
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS

07:30 AM - 08:30 AM
NONE
05:00 PM - 06:00 PM

COUNT PERIODS

07:00 AM - 09:00 AM
NONE
04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	67	1553	42	0	1048	AM
NOON	0	0	0	0	0	NOON
PM	24	1109	33	6	1758	PM

Toledo Way — EASTBOUND

AM	NOON	PM	
379	0	166	
0	0	0	0
23	0	108	1
87	0	303	3
91	0	58	0
AM	NOON	PM	

Toledo Way — WESTBOUND

PM	NOON	AM	
19	0	51	0
63	0	233	3
52	0	130	1
0	0	0	0
472	0	186	
PM	NOON	AM	

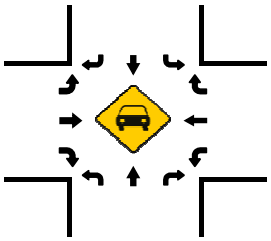
Lake Forest Dr — NORTHBOUND

PM	1219	0	79	1625	136	PM
NOON	0	0	0	0	0	NOON
AM	1774	0	79	974	57	AM

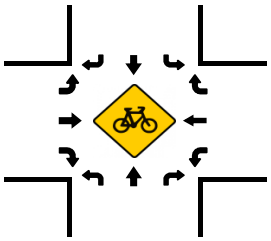
Turning movements (left, through, right, U-turn): 0 2 1 0 (southbound); 0 1 2 0 (northbound)

CONTROL			
Signalized			
TEV	3387	0	3615
	AM	NOON	PM
PHF	0.85		0.96

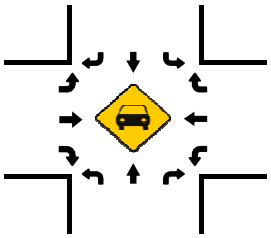
Total Vehicles (AM)



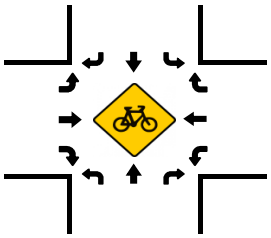
Bikes (AM)



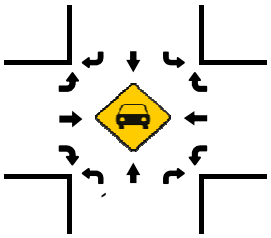
Total Vehicles (Noon)



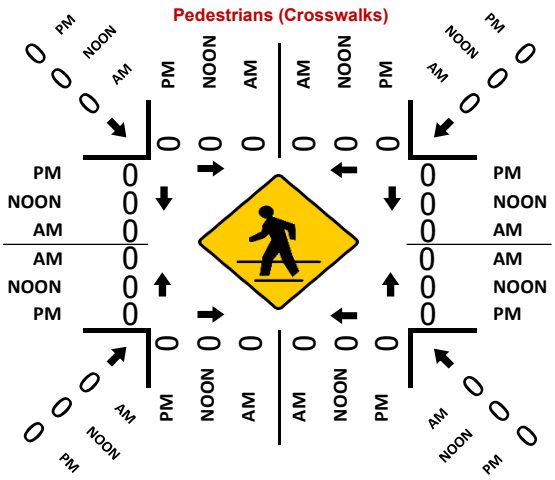
Bikes (NOON)



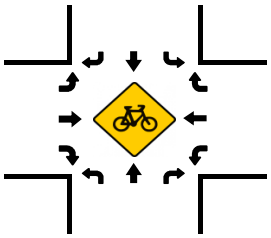
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Ridge Route Dr & Toledo Way

Peak Hour Turning Movement Count

ID: 18-01075-020
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Ridge Route Dr — SOUTHBOUND

AM	83	378	92	0	306	AM
NOON	0	0	0	0	0	NOON
PM	25	178	52	0	355	PM

Toledo Way — EASTBOUND

AM	NOON	PM	
348	0	126	⇦
0	0	0	0
29	0	54	1
134	0	318	2
32	0	19	0
AM	NOON	PM	

Toledo Way — WESTBOUND

PM	NOON	AM	
54	0	50	0
85	0	228	2
22	0	126	1
0	0	0	0
397	0	349	⇨
PM	NOON	AM	

Ridge Route Dr — NORTHBOUND

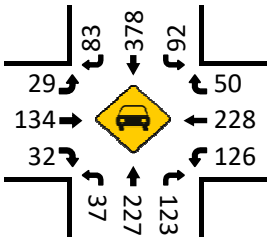
PM	219	0	16	247	27	PM
NOON	0	0	0	0	0	NOON
AM	536	0	37	227	123	AM

Turning movements (0 = U-turn, 1 = left, 2 = through, 0 = right):

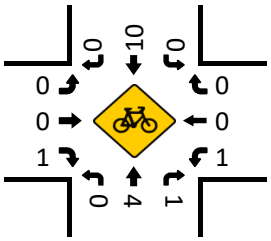
0	2	1	0	
0	1	2	0	

CONTROL			
Signalized			
TEV	1539	0	1097
	AM	NOON	PM
PHF	0.67		0.95

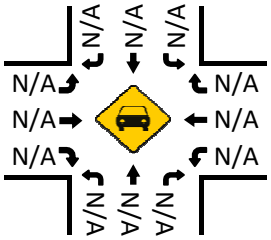
Total Vehicles (AM)



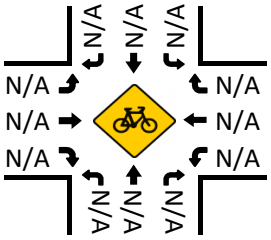
Bikes (AM)



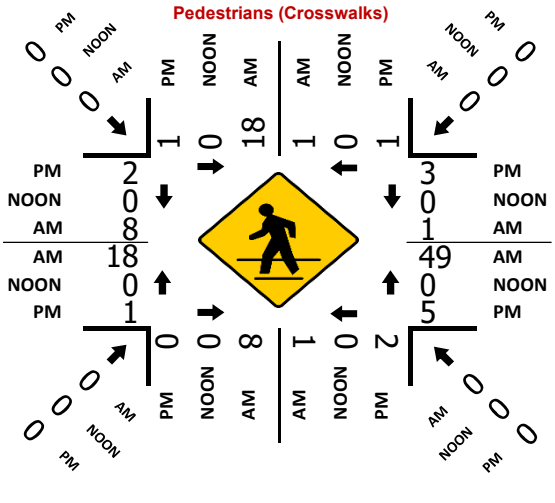
Total Vehicles (Noon)



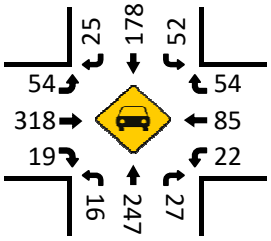
Bikes (NOON)



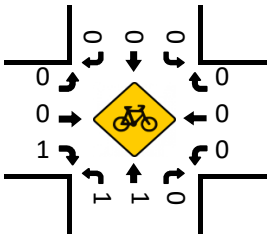
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

El Toro Rd & Toledo Way

Peak Hour Turning Movement Count

ID: 18-01075-021
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	239	1698	2	0	1067	AM
NOON	0	0	0	0	0	NOON
PM	60	1127	4	0	1790	PM
	0	3	1	0		

Toledo Way — EASTBOUND

AM	NOON	PM	
413	0	145	
0	0	0	0
79	0	210	1.5
3	0	19	0.5
175	0	132	1
AM	NOON	PM	

Toledo Way — WESTBOUND

PM	NOON	AM	
6	0	5	0
1	0	21	1
7	0	29	0
0	0	0	0
41	0	25	
PM	NOON	AM	

CONTROL

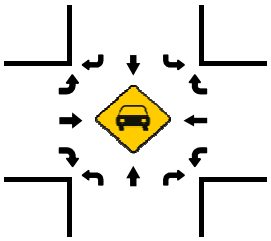
Signalized

TEV	3408	0	3245
	AM	NOON	PM
PHF	0.86		0.94

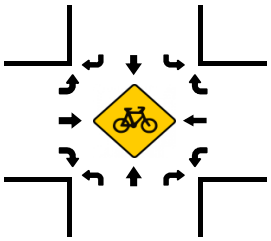
El Toro Rd — NORTHBOUND

	0	1	3	0		
PM	1269	3	84	1574	18	PM
NOON	0	0	0	0	0	NOON
AM	1903	1	153	983	20	AM

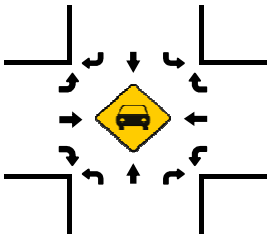
Total Vehicles (AM)



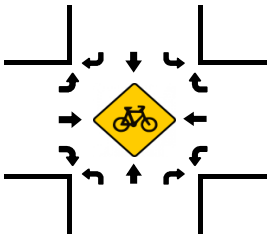
Bikes (AM)



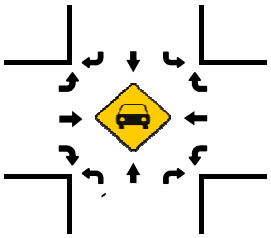
Total Vehicles (Noon)



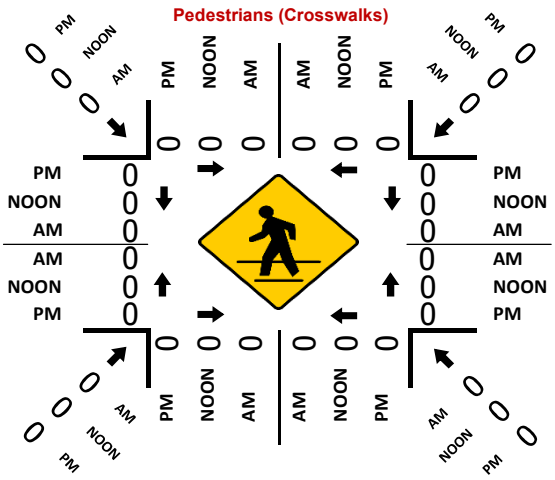
Bikes (NOON)



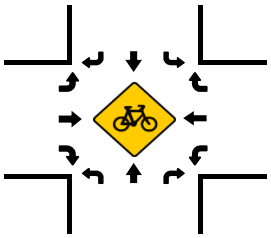
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Bake Pkwy & Jeronimo Rd

Peak Hour Turning Movement Count

ID: 18-01075-022
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Bake Pkwy — SOUTHBOUND

AM	59	1913	56	0	2219	AM
NOON	0	0	0	0	0	NOON
PM	21	2140	108	0	2208	PM
	0	3	1	0		

Jeronimo Rd — EASTBOUND

AM	NOON	PM	
900	0	166	
0	0	0	0
8	0	68	2
49	0	419	2
111	0	457	1
AM	NOON	PM	

Jeronimo Rd — WESTBOUND

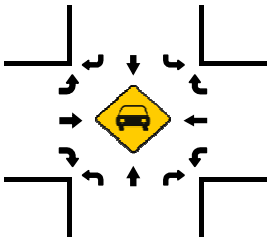
PM	NOON	AM	
65	0	99	0
96	0	432	2
154	0	397	1
0	0	0	0
1030	0	185	
PM	NOON	AM	

Bake Pkwy — NORTHBOUND

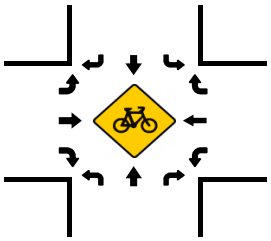
PM	2753	2	49	2075	503	PM
NOON	0	0	0	0	0	NOON
AM	2423	2	409	2112	80	AM
		0	1	3	0	

CONTROL			
Signalized			
TEV	5727	0	6157
	AM	NOON	PM
PHF	0.96		0.93

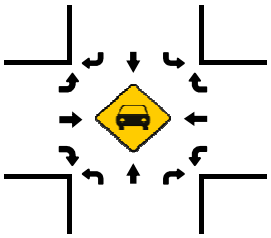
Total Vehicles (AM)



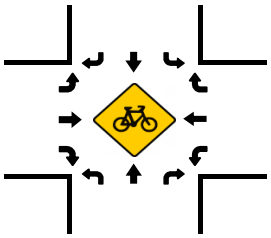
Bikes (AM)



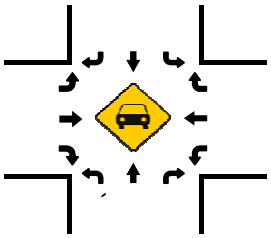
Total Vehicles (Noon)



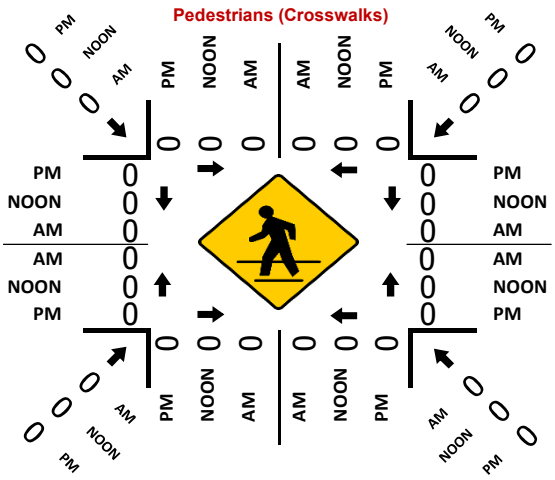
Bikes (NOON)



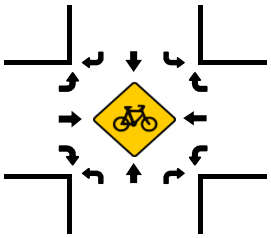
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Lake Forest Dr & Jeronimo Rd

Peak Hour Turning Movement Count

ID: 18-01075-023
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS
07:30 AM - 08:30 AM
NONE
05:00 PM - 06:00 PM

COUNT PERIODS
07:00 AM - 09:00 AM
NONE
04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	326	1257	217	3	1150	AM
NOON	0	0	0	0	0	NOON
PM	119	1010	98	7	1923	PM
	1	3	1	0		

Jeronimo Rd — EASTBOUND

AM	NOON	PM	
955	0	438	
0	0	0	0
80	0	262	1
166	0	737	2
83	0	95	0

Jeronimo Rd — WESTBOUND

	PM	NOON	AM
0	57	0	272
2	229	0	535
1	81	0	242
0	0	0	0
	1079	0	534

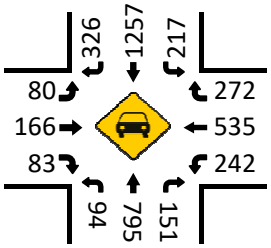
Lake Forest Dr — NORTHBOUND

PM	1188	2	90	1597	244	PM
NOON	0	0	0	0	0	NOON
AM	1583	1	94	795	151	AM
	0	1	2	1		

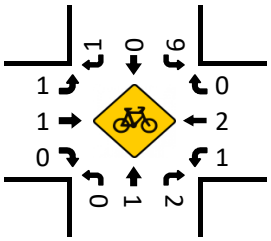
CONTROL
Signalized

	AM	NOON	PM
TEV	4222	0	4628
PHF	0.86		0.95

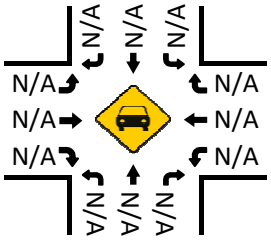
Total Vehicles (AM)



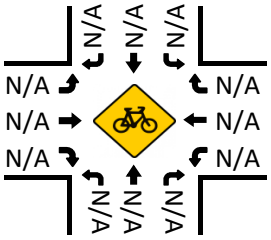
Bikes (AM)



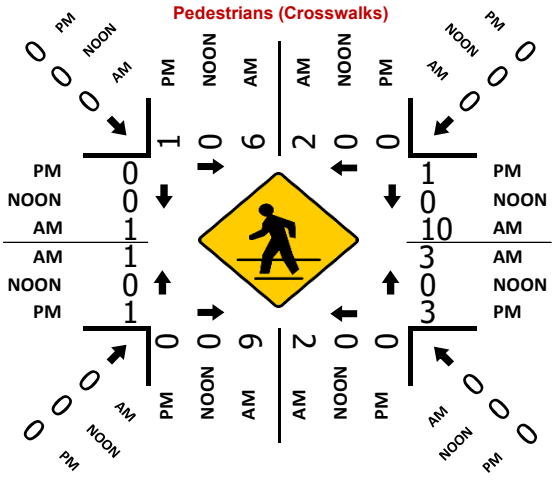
Total Vehicles (Noon)



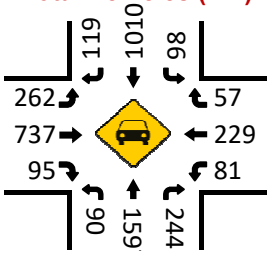
Bikes (NOON)



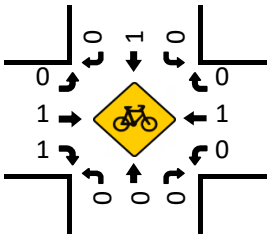
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Ridge Route Dr & Jeronimo Rd

Peak Hour Turning Movement Count

ID: 18-01075-024
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Ridge Route Dr — SOUTHBOUND

AM	210	285	114	2	390
NOON	0	0	0	0	0
PM	28	159	50	1	354

Jeronimo Rd — EASTBOUND

AM	NOON	PM	
983	0	370	⇦
0	0	0	0
92	0	55	1
351	0	863	2
117	0	44	0

Jeronimo Rd — WESTBOUND

	PM	NOON	AM
0	54	0	73
2	309	0	708
1	74	0	111
0	0	0	1
⇨	1007	0	594

Ridge Route Dr — NORTHBOUND

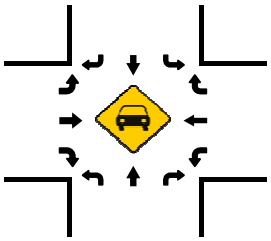
PM	277	0	33	244	94
NOON	0	0	0	0	0
AM	514	1	65	223	128

Turning movements (left, through, right, U-turn): 0 2 1 0

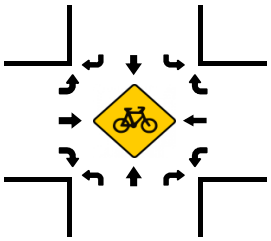
Turning movements (U-turn, left, through, right): 0 1 2 0

CONTROL			
Signalized			
TEV	2481	0	2008
	AM	NOON	PM
PHF	0.78		0.89

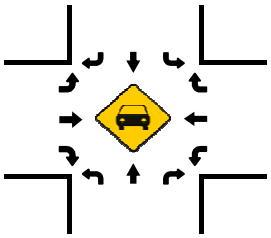
Total Vehicles (AM)



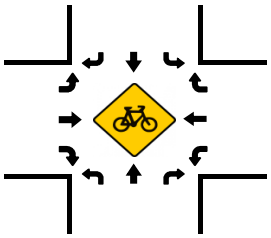
Bikes (AM)



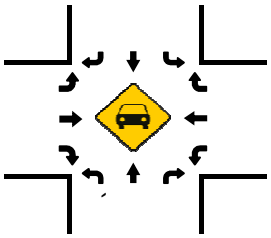
Total Vehicles (Noon)



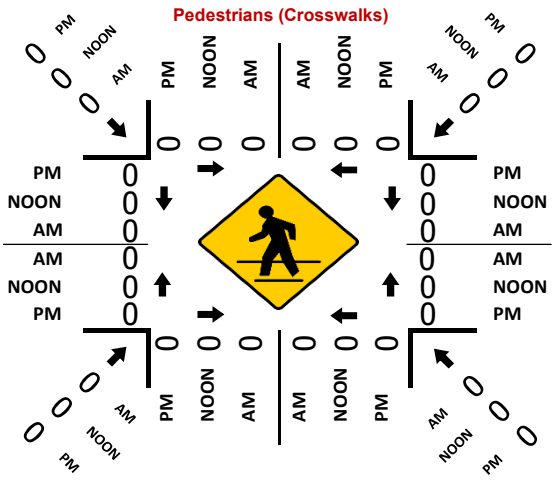
Bikes (NOON)



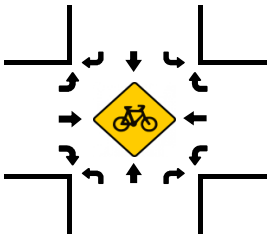
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

El Toro Rd & Jeronimo Rd

Peak Hour Turning Movement Count

ID: 18-01075-025
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	226	1521	261	1	1198	AM
NOON	0	0	0	0	0	NOON
PM	70	922	286	3	1821	PM
	0	3	1	0		

Jeronimo Rd — EASTBOUND

AM	NOON	PM	
824	0	488	
0	0	0	0
130	0	160	1
302	0	722	2
174	0	89	0
AM	NOON	PM	

Jeronimo Rd — WESTBOUND

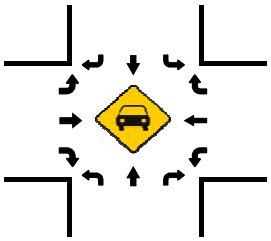
	PM	NOON	AM
1	248	0	245
2	300	0	508
1	231	0	400
0	0	0	0
	1347	0	819
	PM	NOON	AM

El Toro Rd — NORTHBOUND

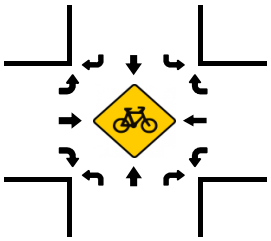
PM	1246	4	118	1410	339	PM
NOON	0	0	0	0	0	NOON
AM	2103	8	90	822	256	AM
		0	1	3	1	

CONTROL			
Signalized			
TEV	4944	0	4902
	AM	NOON	PM
PHF	0.91		0.98

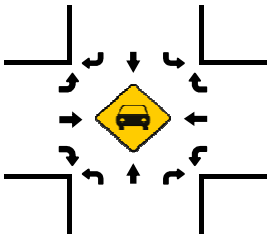
Total Vehicles (AM)



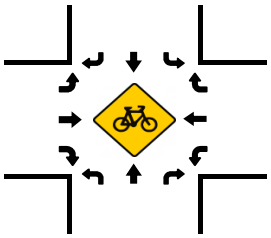
Bikes (AM)



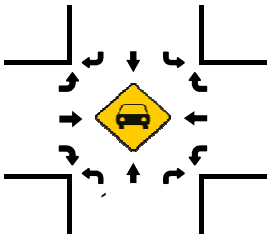
Total Vehicles (Noon)



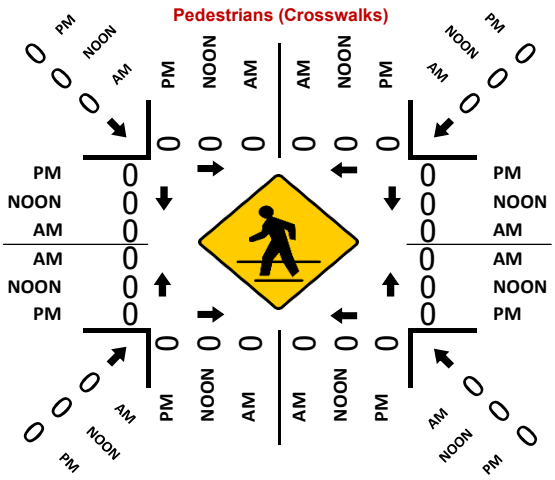
Bikes (NOON)



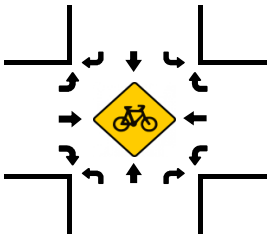
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Los Alisos Blvd & Jeronimo Rd

Peak Hour Turning Movement Count

ID: 18-01075-026
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Los Alisos Blvd — SOUTHBOUND

AM	320	1258	280	39	935	AM
NOON	0	0	0	0	0	NOON
PM	144	574	152	31	1765	PM
	1	3	1	0		

Jeronimo Rd — EASTBOUND

AM	NOON	PM	
1115	0	784	
0	0	6	0
162	0	404	2
560	0	669	2
190	0	196	1
AM	NOON	PM	

Jeronimo Rd — WESTBOUND

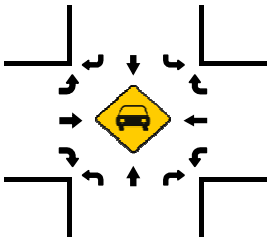
	PM	NOON	AM
1	175	0	110
2	475	0	623
2	194	0	202
0	68	0	43
	1149	0	1088

Los Alisos Blvd — NORTHBOUND

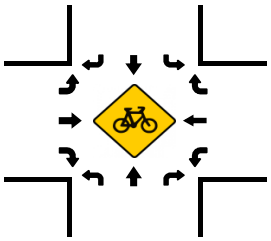
PM	975	11	159	1155	260	PM
NOON	0	0	0	0	0	NOON
AM	1670	20	172	624	205	AM
		0	1	3	1	

CONTROL			
Signalized			
TEV	4808	0	4673
	AM	NOON	PM
PHF	0.91		0.90

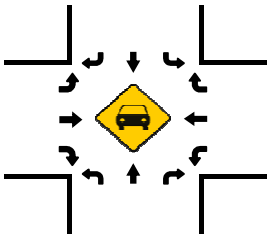
Total Vehicles (AM)



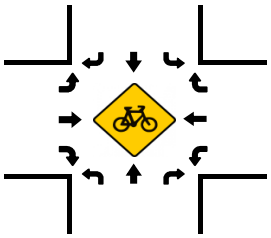
Bikes (AM)



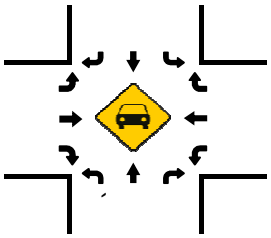
Total Vehicles (Noon)



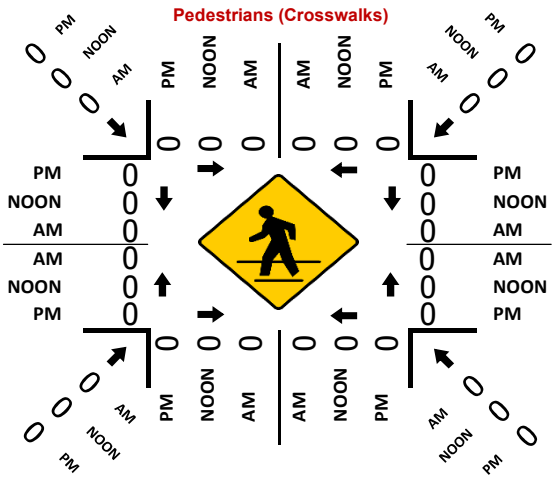
Bikes (NOON)



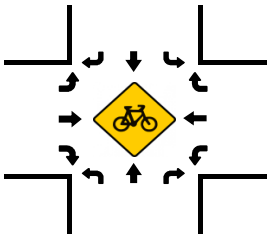
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Lake Forest Dr & Muirlands Blvd

Peak Hour Turning Movement Count

ID: 18-01075-027
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	172	1291	110	0	1009	AM
NOON	0	0	0	0	0	NOON
PM	45	980	193	2	1948	PM
	1	3	2	0		

Muirlands Blvd — EASTBOUND

AM	NOON	PM	
763	0	258	
2	0	1	0
52	0	261	2
166	0	826	2
44	0	104	1
AM	NOON	PM	

Muirlands Blvd — WESTBOUND

	PM	NOON	AM
1	131	0	176
2	178	0	528
2	146	0	291
0	0	0	0
	1353	0	408
	PM	NOON	AM

CONTROL

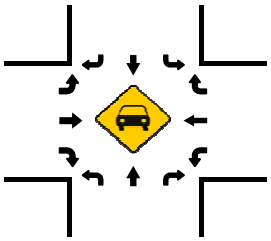
Signalized

	AM	NOON	PM
TEV	3806	0	4789
PHF	0.95		0.98

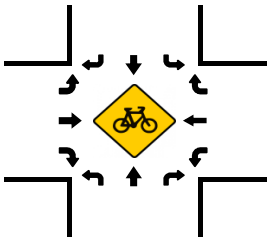
Lake Forest Dr — NORTHBOUND

	0	2	3	1		
PM	1230	0	34	1554	334	PM
NOON	0	0	0	0	0	NOON
AM	1626	0	61	781	132	AM

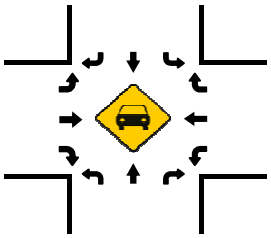
Total Vehicles (AM)



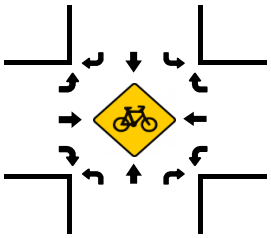
Bikes (AM)



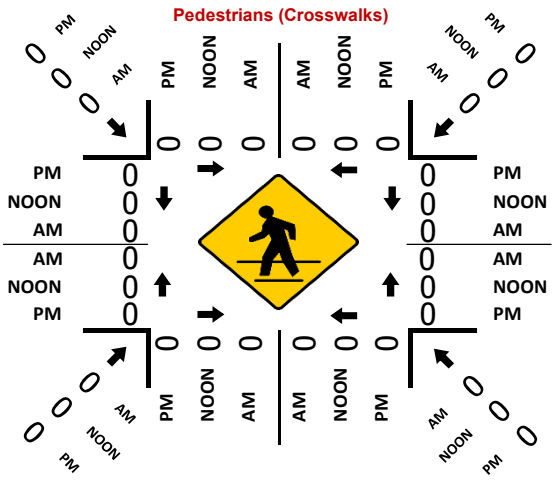
Total Vehicles (Noon)



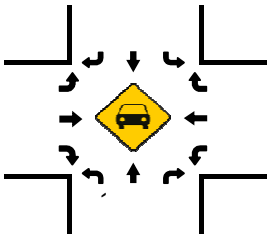
Bikes (NOON)



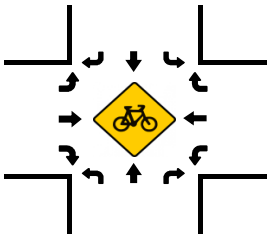
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Ridge Route Dr & Muirlands Blvd

Peak Hour Turning Movement Count

ID: 18-01075-028
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Ridge Route Dr — SOUTHBOUND

AM	104	236	117	0	299
NOON	0	0	0	0	0
PM	46	119	127	7	317

Muirlands Blvd — EASTBOUND

AM	NOON	PM	
945	0	530	⇦
0	0	4	0
41	0	43	1
326	0	1093	2
41	0	73	1

Muirlands Blvd — WESTBOUND

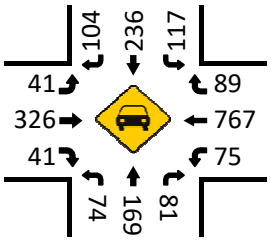
PM	NOON	AM	
81	0	89	1
383	0	767	2
52	0	75	1
4	0	0	0
1369	0	524	⇨

Ridge Route Dr — NORTHBOUND

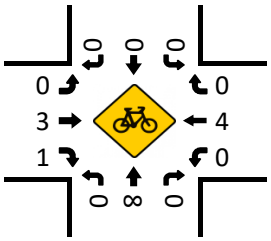
PM	258	14	97	186	145
NOON	0	0	0	0	0
AM	357	5	74	169	81

CONTROL			
Signalized			
TEV	2125	0	2474
	AM	NOON	PM
PHF	0.92		0.95

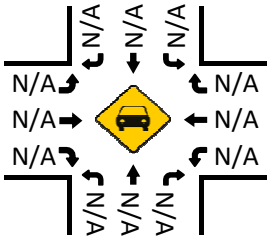
Total Vehicles (AM)



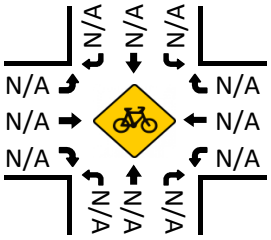
Bikes (AM)



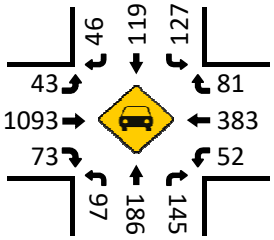
Total Vehicles (Noon)



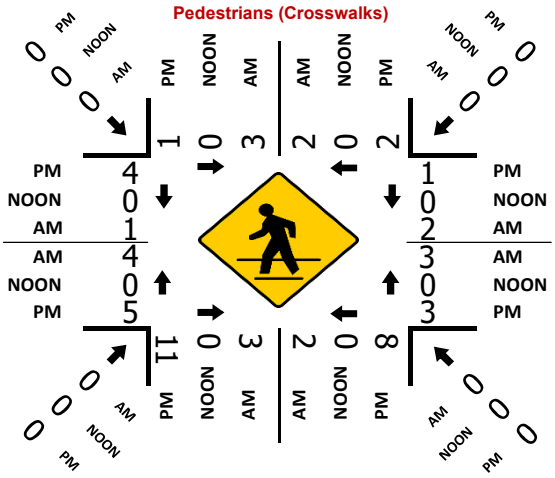
Bikes (NOON)



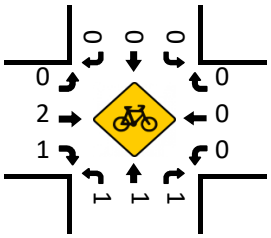
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

El Toro Rd & Muirlands Blvd

Peak Hour Turning Movement Count

ID: 18-01075-029
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	325	1478	202	23	1205	AM
NOON	0	0	0	0	0	NOON
PM	95	956	139	18	1946	PM
	1	3	2	0		

Muirlands Blvd — EASTBOUND

AM	NOON	PM	
1048	0	550	
0	0	1	0
177	0	244	2
298	0	744	2
182	0	319	1
AM	NOON	PM	

Muirlands Blvd — WESTBOUND

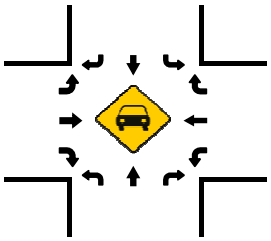
	PM	NOON	AM
1	161	0	215
2	248	0	608
2	289	0	346
0	2	0	2
	1217	0	648

El Toro Rd — NORTHBOUND

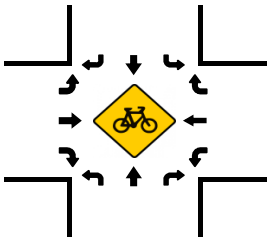
PM	1568	4	206	1523	332	PM
NOON	0	0	0	0	0	NOON
AM	2006	0	115	790	146	AM
		0	2	3	1	

CONTROL			
Signalized			
TEV	4907	0	5281
	AM	NOON	PM
PHF	0.93		0.97

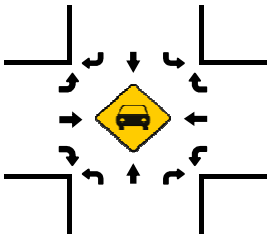
Total Vehicles (AM)



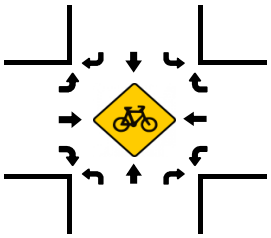
Bikes (AM)



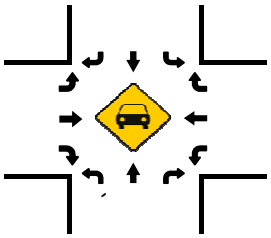
Total Vehicles (Noon)



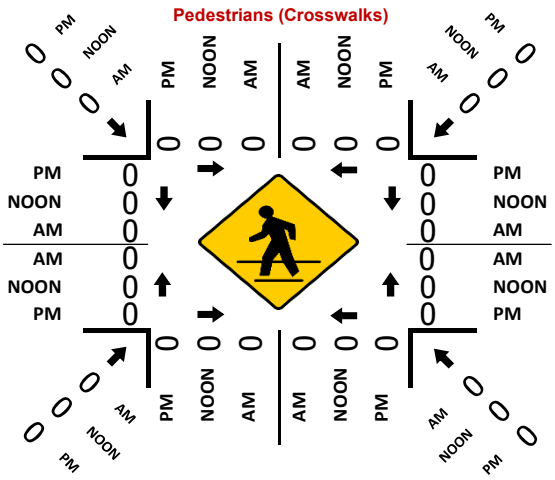
Bikes (NOON)



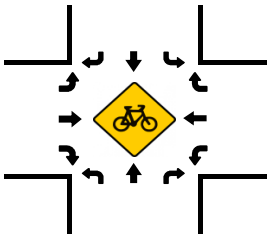
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Los Alisos Blvd & Muirlands Blvd

Peak Hour Turning Movement Count

ID: 18-01075-030
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Los Alisos Blvd — SOUTHBOUND

AM	332	1015	214	87	1002	AM
NOON	0	0	0	0	0	NOON
PM	172	630	196	16	1584	PM
	0	3	1	0		

Muirlands Blvd — EASTBOUND

AM	NOON	PM	
1047	0	683	
0	0	0	0
138	0	294	1
471	0	646	2
182	0	197	0
AM	NOON	PM	

Muirlands Blvd — WESTBOUND

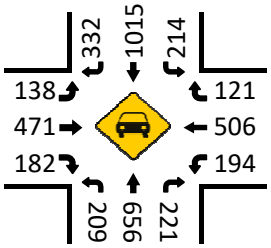
PM	NOON	AM	
163	0	121	1
360	0	506	2
100	0	194	1
0	0	0	0
1051	0	906	
PM	NOON	AM	

Los Alisos Blvd — NORTHBOUND

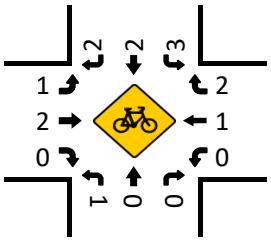
PM	927	0	151	1111	209	PM
NOON	0	0	0	0	0	NOON
AM	1394	3	209	656	221	AM
		0	1	3	1	

CONTROL			
Signalized			
TEV	4349	0	4245
	AM	NOON	PM
PHF	0.88		0.95

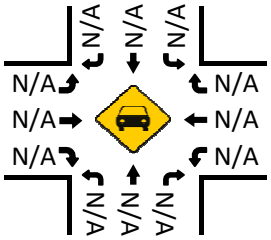
Total Vehicles (AM)



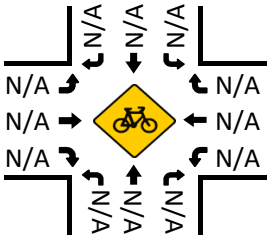
Bikes (AM)



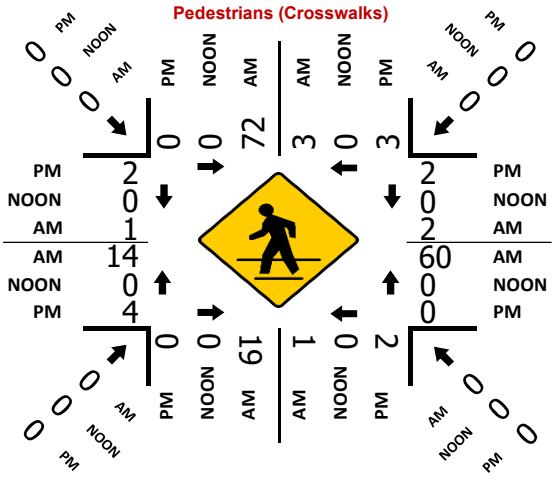
Total Vehicles (Noon)



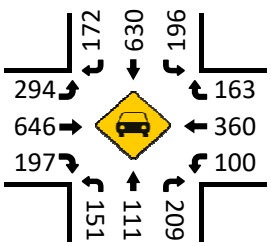
Bikes (NOON)



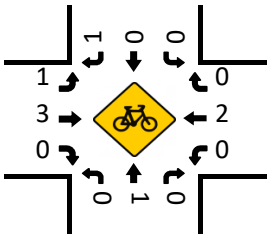
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Los Alisos Blvd

Muirlands Blvd

Prepared by National Data & Surveying Services

Lake Forest Dr & Rockfield Blvd

Peak Hour Turning Movement Count

ID: 18-01075-031
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS		COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

	Right	Through	Left	U-Turn	Approach (Out)
AM	85	1341	130	6	1067
NOON	0	0	0	0	0
PM	107	1080	182	1	2060
Bikes/Peds (red)	0.5	3.5	2	0	

Rockfield Blvd — EASTBOUND

	AM	NOON	PM	
Out	847	0	733	
U-Turn	12	0	29	0
Left	28	0	148	2
Through	103	0	391	2
Right	255	0	518	2

Rockfield Blvd — WESTBOUND

		PM	NOON	AM
Right	1	103	0	112
Through	2	177	0	270
Left	2	298	0	392
U-Turn	0	4	0	1
Out		1102	0	442

Lake Forest Dr — NORTHBOUND

	Out	U-Turn	Left	Through	Right
Bikes/Peds (red)		0	2	3	1
PM	1896	0	420	1808	525
NOON	0	0	0	0	0
AM	1988	0	480	921	208

CONTROL

Signalized

	AM	NOON	PM
TEV	4344	0	5791
PHF	0.97		0.97

Total Vehicles (AM)

Approach	Left	Through	Right	U-Turn
Southbound	130	1341	85	
Eastbound	28	103	255	
Westbound	392	270	112	
Northbound	480	921	208	

Total Vehicles (Noon)

All movements: N/A

Total Vehicles (PM)

Approach	Left	Through	Right
Southbound	182	1080	107
Eastbound	148	391	518
Westbound	298	177	103
Northbound	420	180	525

Bikes (AM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	1	0
Northbound	0	1	0

Bikes (NOON)

All movements: N/A

Bikes (PM)

Approach	Left	Through	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North leg	Eastbound (→)	1	0	0
North leg	Westbound (←)	0	0	0
West leg	Southbound (↓)	2	0	0
West leg	Northbound (↑)	0	0	0
East leg	Southbound (↓)	0	0	0
East leg	Northbound (↑)	0	0	1
South leg	Eastbound (→)	1	0	5
South leg	Westbound (←)	2	0	3
NW corner (diagonal)		0	0	0
NE corner (diagonal)		0	0	0
SW corner (diagonal)		0	0	0
SE corner (diagonal)		0	0	0

Prepared by National Data & Surveying Services

Ridge Route Dr & Rockfield Blvd

Peak Hour Turning Movement Count

ID: 18-01075-032
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Ridge Route Dr — SOUTHBOUND

AM	181	19	91	0	184
NOON	0	0	0	0	0
PM	86	27	106	0	417
	0.5	1	0.5	0	

Rockfield Blvd — EASTBOUND

AM	NOON	PM	
627	0	400	
0	0	0	0
74	0	284	1
280	0	981	2
19	0	52	0
AM	NOON	PM	

Rockfield Blvd — WESTBOUND

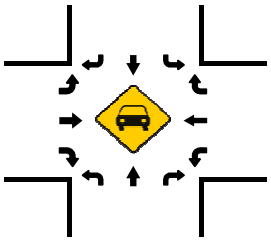
	PM	NOON	AM
0	110	0	64
2	288	0	402
1	25	0	18
0	0	0	0
	1105	0	411
	PM	NOON	AM

	0	0.5	1	0.5	
PM	105	1	26	23	18
NOON	0	0	0	0	0
AM	57	1	44	46	40

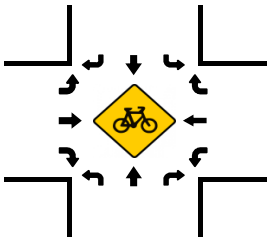
Ridge Route Dr — NORTHBOUND

CONTROL			
Signalized			
TEV	1279	0	2027
	AM	NOON	PM
PHF	0.94		0.90

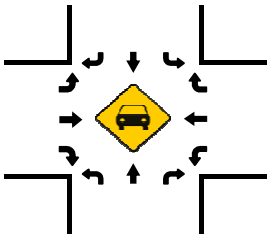
Total Vehicles (AM)



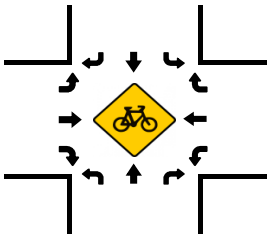
Bikes (AM)



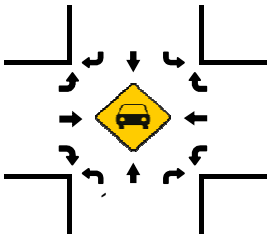
Total Vehicles (Noon)



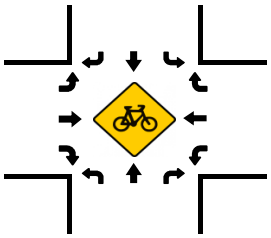
Bikes (NOON)



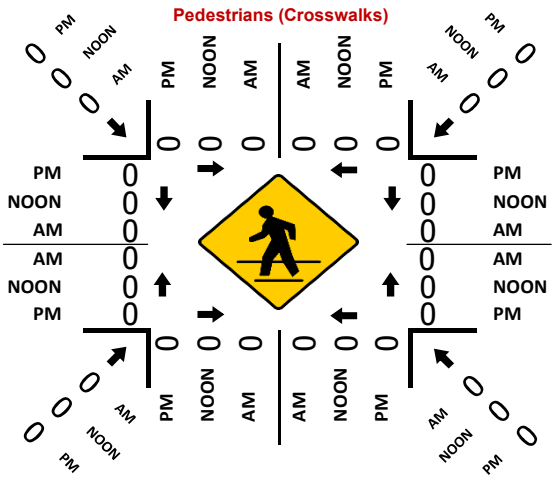
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

El Toro Rd & Rockfield Blvd

Peak Hour Turning Movement Count

ID: 18-01075-033
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	64	1552	165	4	1116	AM
NOON	0	0	0	0	0	NOON
PM	83	1201	150	5	1976	PM
	0	4	2	0		

Rockfield Blvd — EASTBOUND

AM	NOON	PM	
521	0	584	
0	0	0	0
83	0	257	2
214	0	475	2
217	0	320	1
AM	NOON	PM	

Rockfield Blvd — WESTBOUND

PM	NOON	AM	
109	0	153	1
188	0	249	2
276	0	396	2
0	0	0	0
854	0	537	
PM	NOON	AM	

CONTROL

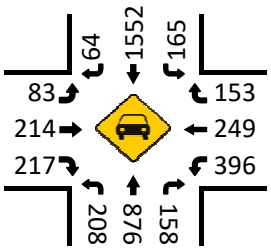
Signalized

	AM	NOON	PM
TEV	4457	0	5394
PHF	0.95		0.96

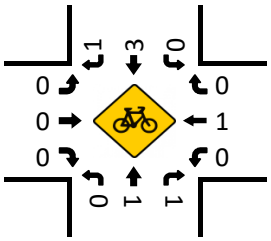
El Toro Rd — NORTHBOUND

	0	2	4	0		
PM	1980	183	313	1605	229	PM
NOON	0	0	0	0	0	NOON
AM	2283	118	208	876	158	AM

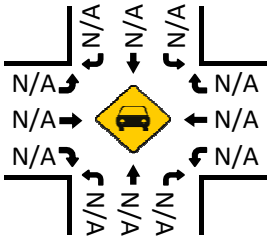
Total Vehicles (AM)



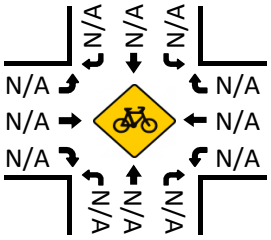
Bikes (AM)



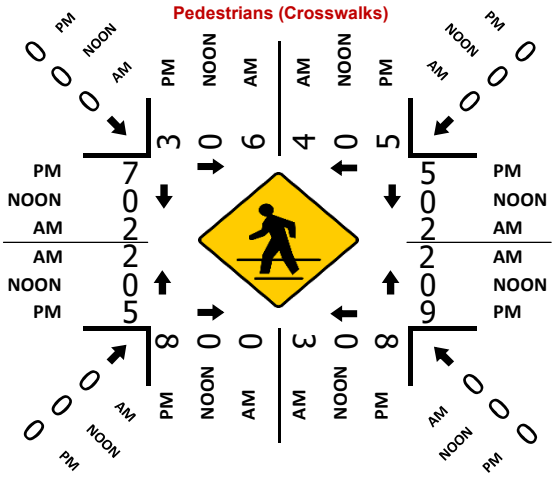
Total Vehicles (Noon)



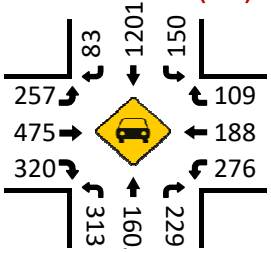
Bikes (NOON)



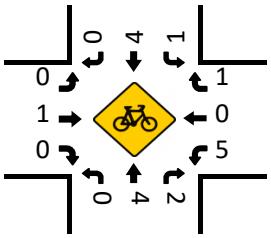
Pedestrians (Crosswalks)



Total Vehicles (PM)



Bikes (PM)



Prepared by National Data & Surveying Services

Los Alisos Blvd & Rockfield Blvd

Peak Hour Turning Movement Count

ID: 18-01075-034
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Los Alisos Blvd — SOUTHBOUND

AM	490	911	11	0	1034	AM
NOON	0	0	0	0	0	NOON
PM	225	652	20	0	1480	PM
	0	2	1	0		

Rockfield Blvd — EASTBOUND

AM	NOON	PM	
728	0	410	
0	0	0	0
253	0	365	1.5
12	0	29	0.5
196	0	280	1
AM	NOON	PM	

Rockfield Blvd — WESTBOUND

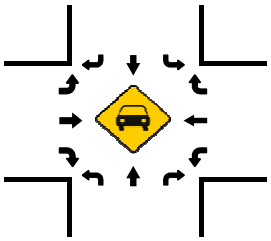
PM	NOON	AM	
16	0	42	0.5
21	0	43	1
9	0	12	0.5
0	0	0	0
51	0	26	
PM	NOON	AM	

Los Alisos Blvd — NORTHBOUND

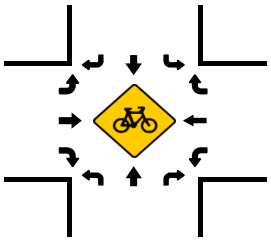
PM	941	0	164	1099	2	PM
NOON	0	0	0	0	0	NOON
AM	1119	0	195	739	3	AM
		0	1	2	0	

CONTROL			
Signalized			
TEV	2907	0	2882
	AM	NOON	PM
PHF	0.90		0.98

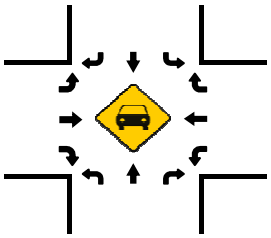
Total Vehicles (AM)



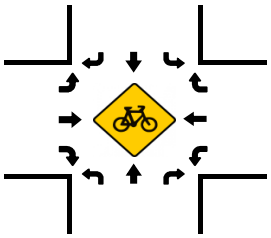
Bikes (AM)



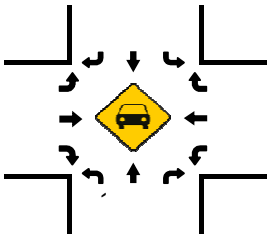
Total Vehicles (Noon)



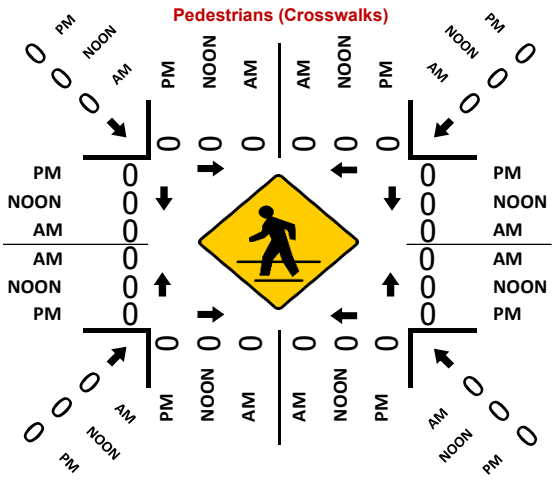
Bikes (NOON)



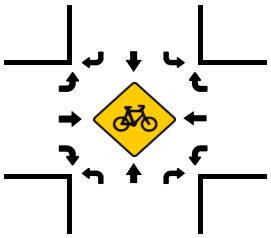
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Lake Forest Dr & I-5 NB Ramp

Peak Hour Turning Movement Count

ID: 18-01075-035
City: Lake Forest

Day: Wednesday
Date: 04/25/2018

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

SOUTHBOUND (Lake Forest Dr)

AM	942	1090	0	0	1728	AM
NOON	0	0	0	0	0	NOON
PM	740	1148	0	0	2997	PM
	1.5	3.5	0	0		

EASTBOUND (I-5 NB Ramp)

AM	NOON	PM	
942	0	740	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

WESTBOUND (I-5 NB Ramp)

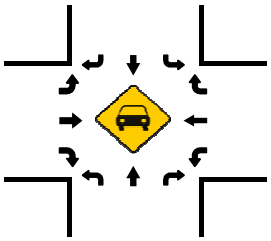
	PM	NOON	AM
2	585	0	513
0	0	0	0
2	219	0	526
0	0	0	0
	0	0	0
	PM	NOON	AM

NORTHBOUND (Lake Forest Dr)

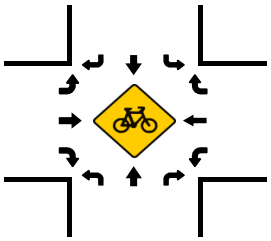
PM	1367	0	0	2412	0	PM
NOON	0	0	0	0	0	NOON
AM	1616	0	0	1215	0	AM
		0	0	4	0	

CONTROL			
Signalized			
TEV	4286	0	5104
	AM	NOON	PM
PHF	0.98		0.95

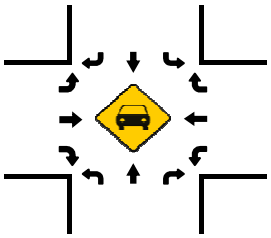
Total Vehicles (AM)



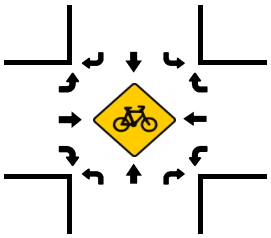
Bikes (AM)



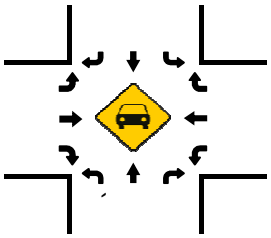
Total Vehicles (Noon)



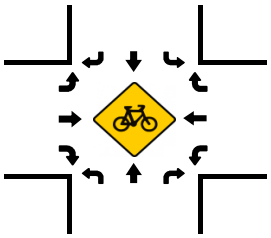
Bikes (NOON)



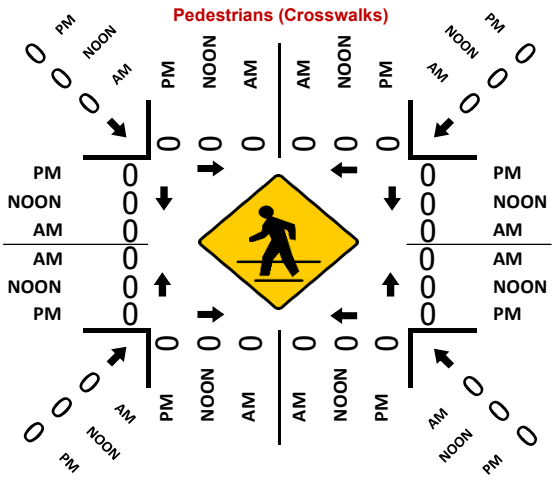
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Lake Forest Dr & I-5 SB Ramp/Avenida De La Carlota
City: Lake Forest
Control: Signalized

Project ID: 18-01075-036
Date: 4/25/2018

Total

NS/EW Streets:	Lake Forest Dr					Lake Forest Dr					I-5 SB Ramp/Avenida De La Carlota					I-5 SB Ramp/Avenida De La Carlota										
AM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					SOUTHBOUND2					
	0	4	0	0	0	2	2.5	1.5	0	0	2.5	1.5	1	0	0	1	0	2	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
7:00 AM	0	90	5	0	40	25	144	63	0	0	159	66	124	0	0	19	0	15	0	0		0	0	0	0	0	750
7:15 AM	0	116	13	0	33	31	147	99	0	0	183	54	131	0	0	16	0	31	0	0		0	0	0	0	0	854
7:30 AM	0	144	10	0	47	35	191	103	0	0	183	71	173	0	0	26	0	35	0	0		0	0	0	0	0	1018
7:45 AM	0	152	11	0	51	42	231	93	1	0	192	74	198	0	0	26	0	32	0	0		0	0	0	0	0	1103
8:00 AM	0	156	13	0	61	71	263	86	1	0	173	81	178	0	0	29	0	39	0	0		0	0	0	0	0	1151
8:15 AM	0	170	12	0	62	60	239	93	0	0	142	79	168	0	0	25	0	27	0	0		0	0	0	0	0	1077
8:30 AM	0	149	21	0	54	80	252	100	0	0	160	85	156	0	0	27	0	49	0	0		0	0	0	0	0	1133
8:45 AM	0	161	16	0	55	73	203	97	0	0	188	77	153	0	0	23	0	50	0	0		0	0	0	0	0	1096
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
TOTAL VOLUMES :	0	1138	101	0	403	417	1670	734	2	0	1380	587	1281	0	0	191	0	278	0	0	0	0	0	0	0	0	8182
APPROACH %'s :	0.00%	69.31%	6.15%	0.00%	24.54%	14.77%	59.16%	26.00%	0.07%	0.00%	42.49%	18.07%	39.44%	0.00%	0.00%	40.72%	0.00%	59.28%	0.00%	0.00%							
PEAK HR :	07:45 AM - 08:45 AM																										TOTAL
PEAK HR VOL :	0	627	57	0	228	253	985	372	2	0	667	319	700	0	0	107	0	147	0	0	0	0	0	0	0	0	4464
PEAK HR FACTOR :	0.000	0.922	0.679	0.000	0.919	0.791	0.936	0.930	0.500	0.000	0.868	0.938	0.884	0.000	0.000	0.922	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.970
			0.934					0.933					0.908					0.836									

PM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					SOUTHBOUND2					
	0	4	0	0	0	2	2.5	1.5	0	0	2.5	1.5	1	0	0	1	0	2	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
4:00 PM	0	247	30	0	109	47	158	142	0	0	320	83	91	0	0	38	0	54	0	0		0	0	0	0	0	1319
4:15 PM	0	244	21	0	100	49	181	114	0	0	354	113	127	0	0	36	0	71	0	0		0	0	0	0	0	1410
4:30 PM	0	271	29	0	110	42	134	97	0	0	337	100	123	0	0	46	0	64	0	0		0	0	0	0	0	1353
4:45 PM	0	219	25	0	116	50	138	105	2	0	430	147	120	0	0	29	0	78	0	0		0	0	0	0	0	1459
5:00 PM	0	391	23	0	179	44	125	127	1	0	376	129	89	0	0	40	0	90	0	0		0	0	0	0	0	1614
5:15 PM	0	266	27	0	161	45	172	155	0	0	418	168	129	0	0	30	0	63	0	0		0	0	0	0	0	1634
5:30 PM	0	266	25	0	151	50	178	133	0	0	415	158	127	0	0	19	0	65	0	0		0	0	0	0	0	1587
5:45 PM	0	225	28	0	116	42	170	124	0	0	340	126	113	0	0	29	0	55	0	0		0	0	0	0	0	1368
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
TOTAL VOLUMES :	0	2129	208	0	1042	369	1256	997	3	0	2990	1024	919	0	0	267	0	540	0	0	0	0	0	0	0	0	11744
APPROACH %'s :	0.00%	63.01%	6.16%	0.00%	30.84%	14.06%	47.85%	37.98%	0.11%	0.00%	60.61%	20.76%	18.63%	0.00%	0.00%	33.09%	0.00%	66.91%	0.00%	0.00%							
PEAK HR :	04:45 PM - 05:45 PM																										TOTAL
PEAK HR VOL :	0	1142	100	0	607	189	613	520	3	0	1639	602	465	0	0	118	0	296	0	0	0	0	0	0	0	0	6294
PEAK HR FACTOR :	0.000	0.730	0.926	0.000	0.848	0.945	0.861	0.839	0.375	0.000	0.953	0.896	0.901	0.000	0.000	0.738	0.000	0.822	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.963
			0.780					0.890					0.946					0.796									

Prepared by National Data & Surveying Services

Paseo De Valencia & Avenida De La Carlota

Peak Hour Turning Movement Count

ID: 18-01075-037
City: Lake Forest

Day: Tuesday
Date: 04/24/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
04:15 PM - 05:15 PM	04:00 PM - 06:00 PM

Paseo De Valencia — SOUTHBOUND

AM	34	773	784	0	652	AM
NOON	0	0	0	0	0	NOON
PM	49	323	787	0	814	PM
	0.5	1	2.5	0		

Avenida De La Carlota — EASTBOUND

AM	NOON	PM	
539	0	460	
0	0	0	0
148	0	253	2
199	0	630	2
94	0	322	1
AM	NOON	PM	

Avenida De La Carlota — WESTBOUND

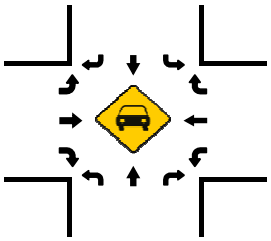
	PM	NOON	AM
1	482	0	469
2	285	0	376
1	20	0	9
0	0	0	0
	1501	0	1012
	PM	NOON	AM

Paseo De Valencia — NORTHBOUND

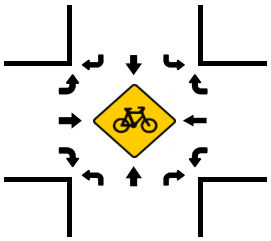
PM	665	0	126	79	84	PM
NOON	0	0	0	0	0	NOON
AM	876	0	129	35	29	AM
		0	2	1	1	

CONTROL			
Signalized			
TEV	3079	0	3440
	AM	NOON	PM
PHF	0.95		0.96

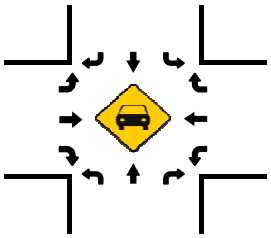
Total Vehicles (AM)



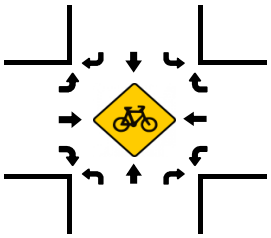
Bikes (AM)



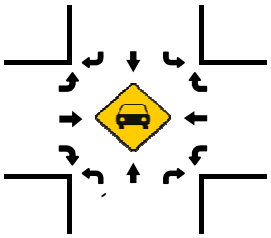
Total Vehicles (Noon)



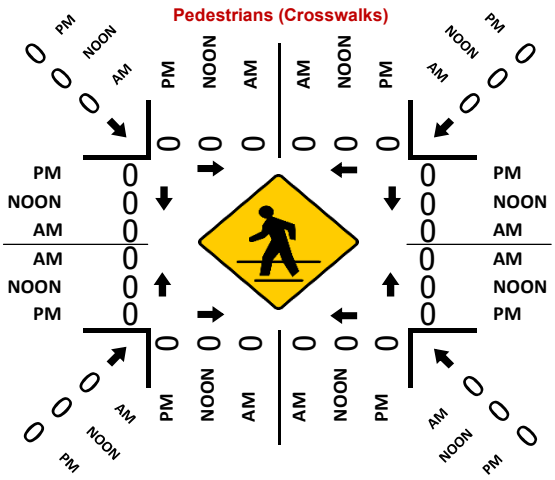
Bikes (NOON)



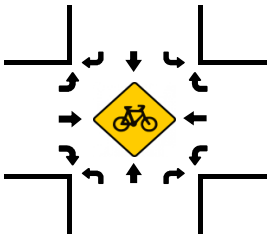
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: El Toro Rd & Bridger Rd/I-5 NB Ramp
City: Lake Forest
Control: Signalized

Project ID: 18-01075-038
Date: 4/24/2018

Total

NS/EW Streets:	El Toro Rd					El Toro Rd					Bridger Rd/I-5 NB Ramp					Bridger Rd/I-5 NB Ramp										
AM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					NORTHBOUND2					
	1	2.5	1.5	0	0	0	4	1	0	0	1	1	1	0	0	1.3	0.3	1.3	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NU2	SL	ST	SR	SU	ST2	EL	ET	ER	EU	ER2	WL	WT	WR	WU	WL2	N2L	N2U	N2L2	N2T2	N2R2	N2U2	TOTAL
7:00 AM	12	170	210	0	0	0	189	21	0	276	8	2	11	0	27	69	11	66	0	0		0	0	0	0	0	1072
7:15 AM	11	213	219	0	0	0	266	31	0	296	9	0	15	0	21	52	5	59	0	1		0	0	0	0	0	1198
7:30 AM	14	212	226	0	1	0	286	20	0	251	10	2	16	0	21	60	12	73	0	1		0	0	0	0	0	1205
7:45 AM	21	270	211	0	0	0	324	13	0	252	7	1	16	0	20	124	17	99	0	1		0	0	0	0	0	1376
8:00 AM	23	232	198	0	0	0	278	30	0	278	5	1	21	0	14	86	8	89	0	0		0	0	0	0	0	1263
8:15 AM	14	223	185	0	1	0	288	28	0	244	16	0	20	0	23	136	12	99	0	0		0	0	0	0	0	1289
8:30 AM	11	222	190	0	0	0	358	21	0	248	10	0	16	0	20	112	15	63	0	1		0	0	0	0	0	1287
8:45 AM	15	261	153	0	0	0	289	20	0	192	13	0	16	0	13	113	12	79	0	0		0	0	0	0	0	1176
	NL	NT	NR	NU	NU2	SL	ST	SR	SU	ST2	EL	ET	ER	EU	ER2	WL	WT	WR	WU	WL2	N2L	N2U	N2L2	N2T2	N2R2	N2U2	TOTAL
TOTAL VOLUMES :	121	1803	1592	0	2	0	2278	184	0	2037	78	6	131	0	159	752	92	627	0	4	0	0	0	0	0	0	9866
APPROACH %'s :	3.44%	51.25%	45.25%	0.00%	0.06%	0.00%	50.63%	4.09%	0.00%	45.28%	20.86%	1.60%	35.03%	0.00%	42.51%	50.98%	6.24%	42.51%	0.00%	0.27%							
PEAK HR :	**07:45 AM - 08:45 AM**																										TOTAL
PEAK HR VOL :	69	947	784	0	1	0	1248	92	0	1022	38	2	73	0	77	458	52	350	0	2	0	0	0	0	0	0	5215
PEAK HR FACTOR :	0.750	0.877	0.929	0.000	0.250	0.000	0.872	0.767	0.000	0.919	0.594	0.500	0.869	0.000	0.837	0.842	0.765	0.884	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.947
			0.897					0.942					0.805					0.872									

PM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					NORTHBOUND2					
	1	2.5	1.5	0	0	0	4	1	0	0	1	1	1	0	0	1.3	0.3	1.3	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NU2	SL	ST	SR	SU	ST2	EL	ET	ER	EU	ER2	WL	WT	WR	WU	WL2	N2L	N2U	N2L2	N2T2	N2R2	N2U2	TOTAL
4:00 PM	19	351	210	0	1	0	259	23	0	141	21	0	20	0	21	122	14	162	0	1		0	0	0	0	0	1365
4:15 PM	21	401	194	0	0	0	323	28	0	143	24	1	32	0	18	134	14	186	0	2		0	0	0	0	0	1521
4:30 PM	20	389	210	0	0	0	311	28	0	136	18	1	27	0	31	120	15	159	0	0		0	0	0	0	0	1465
4:45 PM	21	358	209	0	0	0	299	25	0	124	21	0	27	0	23	135	13	177	0	1		0	0	0	0	0	1433
5:00 PM	18	394	232	0	0	0	278	29	0	124	39	2	33	0	22	127	10	158	0	1		0	0	0	0	0	1467
5:15 PM	14	423	230	0	0	0	325	23	0	118	16	0	18	0	20	133	15	187	0	0		0	0	0	0	0	1522
5:30 PM	22	391	217	0	0	0	279	18	0	142	20	0	29	0	22	115	13	171	0	0		0	0	0	0	0	1439
5:45 PM	16	344	154	0	0	0	302	36	0	136	23	0	21	0	17	138	8	157	0	0		0	0	0	0	0	1352
	NL	NT	NR	NU	NU2	SL	ST	SR	SU	ST2	EL	ET	ER	EU	ER2	WL	WT	WR	WU	WL2	N2L	N2U	N2L2	N2T2	N2R2	N2U2	TOTAL
TOTAL VOLUMES :	151	3051	1656	0	1	0	2376	210	0	1064	182	4	207	0	174	1024	102	1357	0	5	0	0	0	0	0	0	11564
APPROACH %'s :	3.11%	62.79%	34.08%	0.00%	0.02%	0.00%	65.10%	5.75%	0.00%	29.15%	32.10%	0.71%	36.51%	0.00%	30.69%	41.16%	4.10%	54.54%	0.00%	0.20%							
PEAK HR :	**04:30 PM - 05:30 PM**																										TOTAL
PEAK HR VOL :	73	1564	881	0	0	0	1213	105	0	502	94	3	105	0	96	515	53	681	0	2	0	0	0	0	0	0	5887
PEAK HR FACTOR :	0.869	0.924	0.949	0.000	0.000	0.000	0.933	0.905	0.000	0.923	0.603	0.375	0.795	0.000	0.774	0.954	0.883	0.910	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.967
			0.944					0.958					0.776					0.934									

National Data & Surveying Services

Intersection Turning Movement Count

Location: El Toro Rd & Avenida De La Carlota
City: Lake Forest
Control: Signalized

Project ID: 18-01075-039
Date: 4/24/2018

Total

NS/EW Streets:	El Toro Rd					El Toro Rd					Avenida De La Carlota					Avenida De La Carlota										
AM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					SOUTHBOUND2					
	0	4	0	0	0	2	3	1	0	0	3	2	1	0	0	0.5	0.5	2	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
7:00 AM	0	129	2	0	30	16	132	109	0	0	142	25	10	0	4	3	9	112	0	8		0	0	0	0	0	731
7:15 AM	0	179	8	0	40	13	157	155	0	0	165	50	20	0	7	5	17	112	0	13		0	0	0	0	0	941
7:30 AM	0	188	11	0	77	14	187	180	0	0	141	43	18	0	8	8	11	120	0	15		0	0	0	0	0	1021
7:45 AM	0	209	4	0	55	23	217	195	0	0	182	72	38	0	6	10	22	108	0	15		0	0	0	0	0	1156
8:00 AM	0	219	7	0	69	18	237	165	0	0	152	77	16	0	6	8	20	77	0	9		0	0	0	0	0	1080
8:15 AM	0	196	6	0	45	43	219	190	0	0	177	52	24	0	5	11	37	66	0	11		0	0	0	0	0	1082
8:30 AM	0	205	4	0	60	34	271	192	0	0	135	50	27	0	5	5	30	76	0	9		0	0	0	0	0	1103
8:45 AM	0	187	9	0	50	24	242	159	0	0	168	67	31	0	5	10	29	64	0	11		0	0	0	0	0	1056
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
TOTAL VOLUMES :	0	1512	51	0	426	185	1662	1345	0	0	1262	436	184	0	46	60	175	735	0	91	0	0	0	0	0	0	8170
APPROACH %'s :	0.00%	76.02%	2.56%	0.00%	21.42%	5.80%	52.07%	42.14%	0.00%	0.00%	65.46%	22.61%	9.54%	0.00%	2.39%	5.66%	16.49%	69.27%	0.00%	8.58%							
PEAK HR :		07:45 AM - 08:45 AM																									TOTAL
PEAK HR VOL :	0	829	21	0	229	118	944	742	0	0	646	251	105	0	22	34	109	327	0	44	0	0	0	0	0	0	4421
PEAK HR FACTOR :	0.000	0.946	0.750	0.000	0.830	0.686	0.871	0.951	0.000	0.000	0.887	0.815	0.691	0.000	0.917	0.773	0.736	0.757	0.000	0.733	0.000	0.000	0.000	0.000	0.000	0.000	0.956
			0.914					0.907					0.859					0.829									

PM	NORTHBOUND					SOUTHBOUND					EASTBOUND					WESTBOUND					SOUTHBOUND2					
	0	4	0	0	0	2	3	1	0	0	3	2	1	0	0	0.5	0.5	2	0	0	0	0	0	0	0	
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
4:00 PM	0	301	12	0	75	54	203	135	0	0	195	117	35	0	8	7	19	80	0	38		0	0	0	0	0	1279
4:15 PM	0	334	19	0	63	52	251	177	0	0	184	109	24	0	20	15	25	78	0	18		0	0	0	0	0	1369
4:30 PM	0	372	13	0	83	51	234	170	0	0	192	125	20	0	18	11	23	67	0	25		0	0	0	0	0	1404
4:45 PM	0	307	12	0	76	58	227	177	0	0	194	122	32	0	9	11	27	83	0	30		0	0	0	0	0	1365
5:00 PM	0	345	14	0	79	64	210	156	0	0	191	144	34	0	18	12	22	110	0	36		0	0	0	0	0	1435
5:15 PM	0	387	12	0	94	57	258	149	0	0	188	117	40	0	24	9	26	90	0	24		0	0	0	0	0	1475
5:30 PM	0	367	15	0	85	49	236	150	0	1	173	138	28	0	21	11	24	77	0	31		0	0	0	0	0	1406
5:45 PM	0	271	18	0	70	56	220	175	0	0	160	117	34	0	11	7	20	74	0	26		0	0	0	0	0	1259
	NL	NT	NR	NU	NT2	SL	ST	SR	SU	SU2	EL	ET	ER	EU	EL2	WL	WT	WR	WU	WR2	S2L	S2U	S2L2	S2T2	S2R2	S2U2	TOTAL
TOTAL VOLUMES :	0	2684	115	0	625	441	1839	1289	0	1	1477	989	247	0	129	83	186	659	0	228	0	0	0	0	0	0	10992
APPROACH %'s :	0.00%	78.39%	3.36%	0.00%	18.25%	12.35%	51.51%	36.11%	0.00%	0.03%	51.97%	34.80%	8.69%	0.00%	4.54%	7.18%	16.09%	57.01%	0.00%	19.72%							
PEAK HR :		04:45 PM - 05:45 PM																									TOTAL
PEAK HR VOL :	0	1406	53	0	334	228	931	632	0	1	746	521	134	0	72	43	99	360	0	121	0	0	0	0	0	0	5681
PEAK HR FACTOR :	0.000	0.908	0.883	0.000	0.888	0.891	0.902	0.893	0.000	0.250	0.961	0.905	0.838	0.000	0.750	0.896	0.917	0.818	0.000	0.840	0.000	0.000	0.000	0.000	0.000	0.000	0.963
			0.909					0.966					0.952					0.865									

Prepared by National Data & Surveying Services

Portola Pkwy & Rancho Pkwy

Peak Hour Turning Movement Count

ID: 18-01075-040
City: Lake Forest

Day: Tuesday
Date: 04/17/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SOUTHBOUND — Portola Pkwy

AM	162	667	42	0	1351	AM
NOON	0	0	0	0	0	NOON
PM	101	1274	32	0	1020	PM
	1	3	2	0		

EASTBOUND — Rancho Pkwy

AM	NOON	PM	
978	0	523	
0	0	0	0
62	0	209	1.5
55	0	47	0.5
269	0	1001	1
AM	NOON	PM	

WESTBOUND — Rancho Pkwy

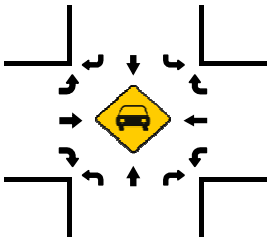
PM	NOON	AM	
33	0	29	1.5
25	0	26	1
20	0	6	1.5
0	0	1	0
86	0	111	
PM	NOON	AM	

NORTHBOUND — Portola Pkwy

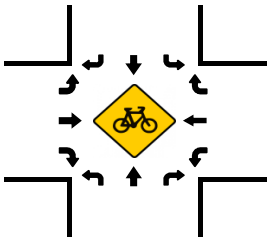
PM	2347	52	397	778	7	PM
NOON	0	0	0	0	0	NOON
AM	947	5	790	1260	13	AM
		0	2	3	0	

CONTROL			
Signalized			
TEV	3387	0	3976
	AM	NOON	PM
PHF	0.85		0.95

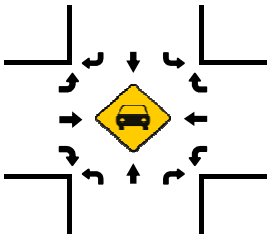
Total Vehicles (AM)



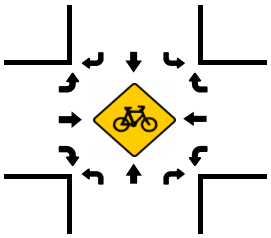
Bikes (AM)



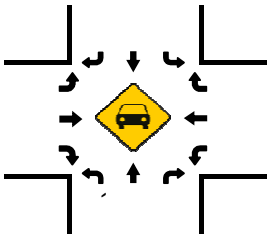
Total Vehicles (Noon)



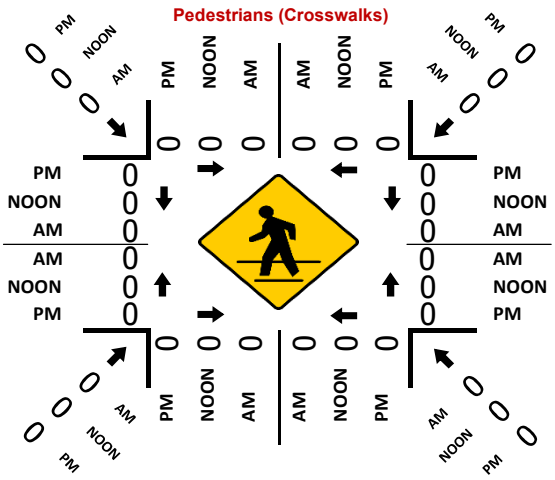
Bikes (NOON)



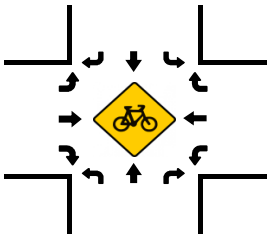
Total Vehicles (PM)



Pedestrians (Crosswalks)



Bikes (PM)



Prepared by National Data & Surveying Services

Alton Pkwy & Rancho Pkwy S

Peak Hour Turning Movement Count

ID: 18-01075-041
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Alton Pkwy — SOUTHBOUND

AM	55	1207	133	1	542	AM
NOON	0	0	0	0	0	NOON
PM	36	493	19	3	1253	PM
	0	3	2	0		

Rancho Pkwy S — EASTBOUND

AM	NOON	PM	
166	0	222	
0	0	0	0
34	0	21	1
26	0	21	2
210	0	143	1
AM	NOON	PM	

Rancho Pkwy S — WESTBOUND

	PM	NOON	AM
0	131	0	26
2	40	0	29
1	168	0	142
0	6	0	7
	161	0	280
	PM	NOON	AM

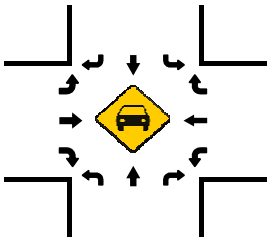
Alton Pkwy — NORTHBOUND

PM	804	0	146	1098	115	PM
NOON	0	0	0	0	0	NOON
AM	1560	1	82	481	114	AM
		0	1	3	1	

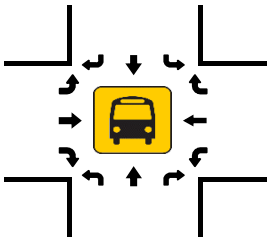
CONTROL: Signalized

	AM	NOON	PM
TEV	2548	0	2440
PHF	0.88		0.91

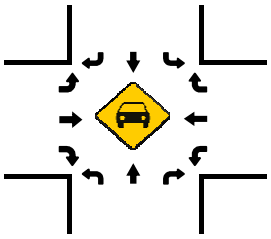
Total Vehicles (AM)



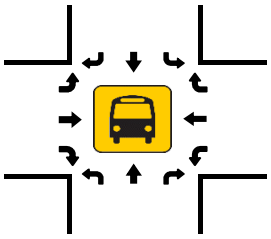
Total Vehicles (AM)



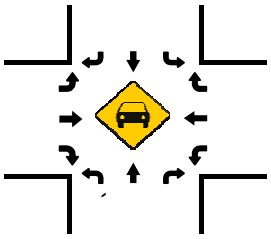
Total Vehicles (NOON)



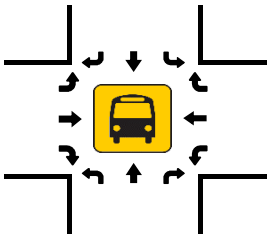
Total Vehicles (NOON)



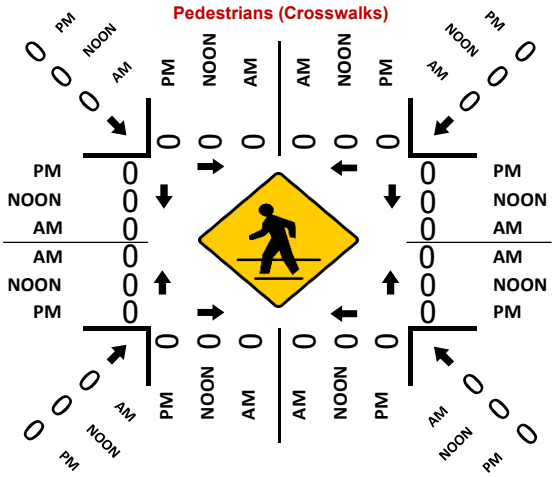
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Alton Pkwy & Commercentre Dr

Peak Hour Turning Movement Count

ID: 18-01075-042
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SOUTHBOUND (Alton Pkwy)

AM	0	1591	150	1	591	AM
NOON	0	0	0	0	0	NOON
PM	0	762	24	0	1456	PM
	0	3	1	0		

EASTBOUND (Commercentre Dr)

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

WESTBOUND (Commercentre Dr)

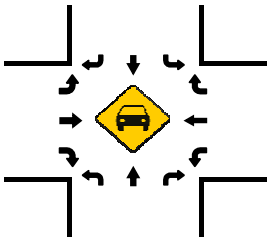
	PM	NOON	AM
1.5	126	0	34
0	0	0	0
1.5	547	0	194
0	0	0	0
	186	0	486
	PM	NOON	AM

NORTHBOUND (Alton Pkwy)

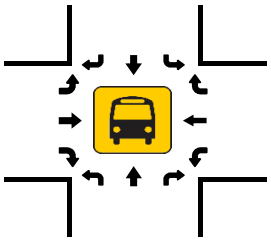
PM	1309	0	0	1330	162	PM
NOON	0	0	0	0	0	NOON
AM	1785	0	0	556	336	AM
		0	0	3	0	

CONTROL			
Signalized			
TEV	2862	0	2951
	AM	NOON	PM
PHF	0.93		0.90

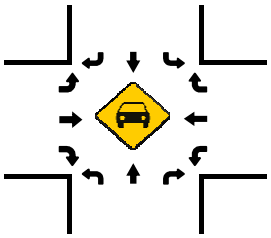
Total Vehicles (AM)



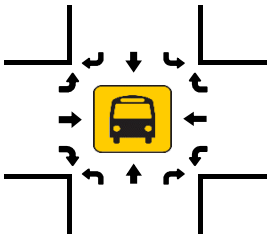
Total Vehicles (AM)



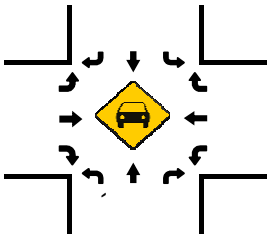
Total Vehicles (NOON)



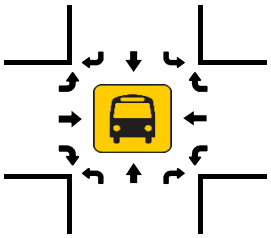
Total Vehicles (NOON)



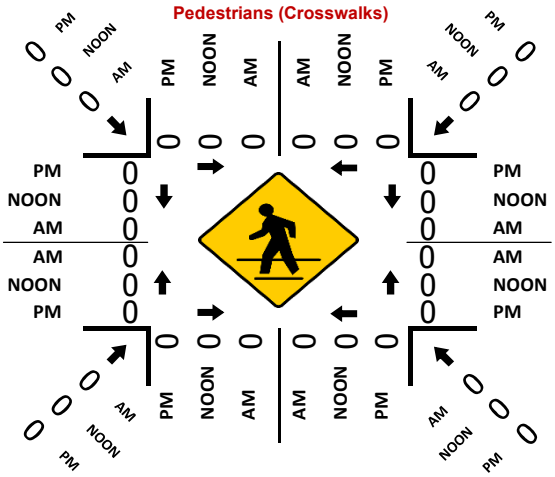
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

El Toro Rd & Glenn Ranch Rd

Peak Hour Turning Movement Count

ID: 18-01075-051
City: Lake Forest

Day: Friday
Date: 04/20/2018

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
05:00 PM - 06:00 PM	PM	04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	233	655	0	0	419	AM
NOON	0	0	0	0	0	NOON
PM	73	365	0	0	899	PM
	0	2	0	0		

Glenn Ranch Rd — EASTBOUND

AM	NOON	PM	
457	0	216	
1	0	0	0
53	0	273	1
0	0	0	0
180	0	158	1
AM	NOON	PM	

Glenn Ranch Rd — WESTBOUND

	PM	NOON	AM
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
	0	0	0
	PM	NOON	AM

CONTROL

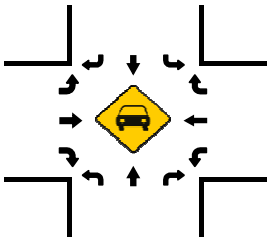
Signalized

	AM	NOON	PM
TEV	1711	0	1638
PHF	0.81		0.97

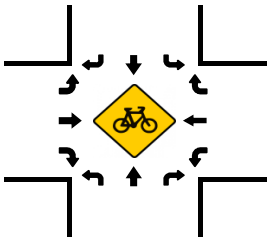
El Toro Rd — NORTHBOUND

		0	1	2	0	
PM	523	0	143	626	0	PM
NOON	0	0	0	0	0	NOON
AM	835	0	223	366	0	AM

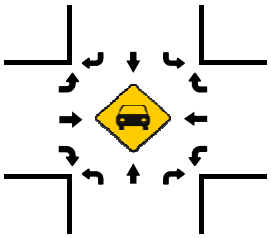
Total Vehicles (AM)



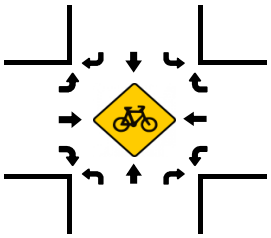
Bikes (AM)



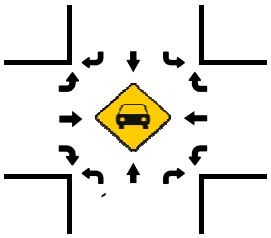
Total Vehicles (Noon)



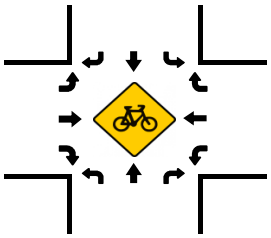
Bikes (NOON)



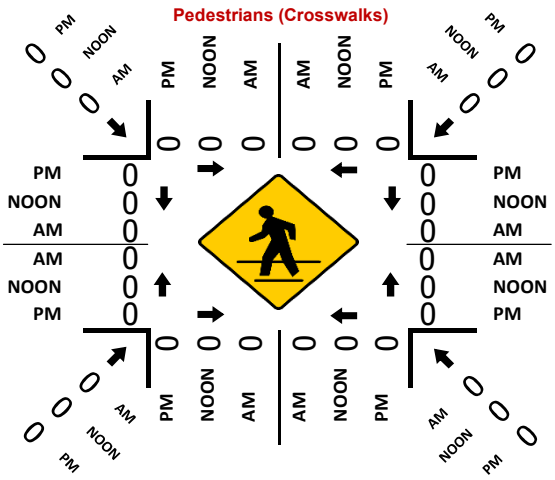
Total Vehicles (PM)



Bikes (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Bake Pkwy & Dimension Dr

Peak Hour Turning Movement Count

ID: 18-01075-056
City: Lake Forest

Day: Thursday
Date: 04/19/2018

	PEAK HOURS	COUNT PERIODS
AM	07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Bake Pkwy – SOUTHBOUND

	Right	Thru	Left	U-Turn	Departing
AM	69	1019	177	14	938
NOON	0	0	0	0	0
PM	92	800	178	2	1408
Lanes	0	2	1	0	

Dimension Dr – WESTBOUND

	Lanes	PM	NOON	AM
Right	1	180	0	119
Thru	0	95	0	23
Left	2	131	0	42
U-Turn	0	10	0	11
Departing		278	0	354

Dimension Dr – EASTBOUND

	AM	NOON	PM	Lanes
Departing	111	0	274	
U-Turn	0	0	0	0
Left	92	0	49	1
Thru	61	0	46	1
Right	80	0	26	1

Bake Pkwy – NORTHBOUND

	Departing	U-Turn	Left	Thru	Right
Lanes		0	1	2	0
PM	957	0	87	1177	44
NOON	0	0	0	0	0
AM	1141	0	19	713	105

CONTROL

Signalized

	AM	NOON	PM
TEV	2544	0	2917
PHF	0.95		0.95

Total Vehicles (AM)

Approach	Right	Thru	Left
Southbound	69	1019	177
Westbound	119	23	42
Eastbound	80	61	92
Northbound	105	713	19

Total Vehicles (Noon)

Approach	Right	Thru	Left
Southbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Total Vehicles (PM)

Approach	Right	Thru	Left
Southbound	92	800	178
Westbound	180	95	131
Eastbound	26	46	49
Northbound	44	1177	87

Bikes (AM)

Approach	Right	Thru	Left
Southbound	0	0	0
Westbound	0	0	0
Eastbound	0	2	0
Northbound	0	0	0

Bikes (NOON)

Approach	Right	Thru	Left
Southbound	N/A	N/A	N/A
Westbound	N/A	N/A	N/A
Eastbound	N/A	N/A	N/A
Northbound	N/A	N/A	N/A

Bikes (PM)

Approach	Right	Thru	Left
Southbound	0	0	1
Westbound	1	0	0
Eastbound	0	1	0
Northbound	0	2	0

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North	Eastbound	2	0	0
North	Westbound	0	0	4
West	Southbound	0	0	1
West	Northbound	0	0	0
East	Southbound	0	0	0
East	Northbound	1	0	3
South	Eastbound	0	0	0
South	Westbound	0	0	2
Diagonal NW		0	0	0
Diagonal NE		0	0	0
Diagonal SW		0	0	0
Diagonal SE		0	0	0

Prepared by National Data & Surveying Services

Lake Forest Dr & Dimension Dr

Peak Hour Turning Movement Count

ID: 18-01075-057
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	417	443	16	2	837	AM
NOON	0	0	0	0	0	NOON
PM	188	762	34	11	1232	PM
	0	2	1	0		

Dimension Dr — EASTBOUND

AM	NOON	PM	
572	0	283	
8	0	19	0
151	0	409	1.5
3	0	8	0.5
61	0	147	1
AM	NOON	PM	

Dimension Dr — WESTBOUND

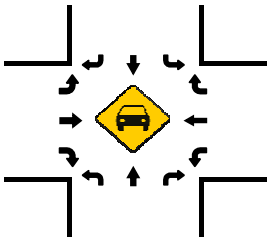
	PM	NOON	AM
0.5	14	0	2
0.5	7	0	2
1	25	0	5
0	0	0	0
	62	0	23
	PM	NOON	AM

Lake Forest Dr — NORTHBOUND

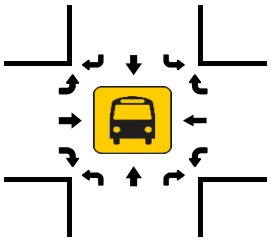
PM	966	32	69	798	20	PM
NOON	0	0	0	0	0	NOON
AM	548	39	145	682	4	AM
		0	1	2	0	

CONTROL			
Signalized			
TEV	1980	0	2543
	AM	NOON	PM
PHF	0.93		0.87

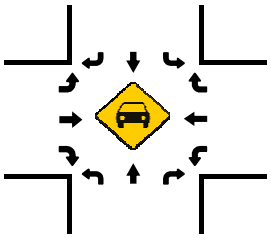
Total Vehicles (AM)



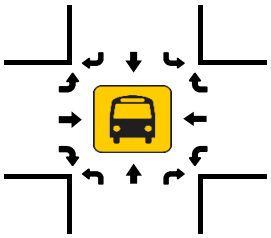
Total Vehicles (AM)



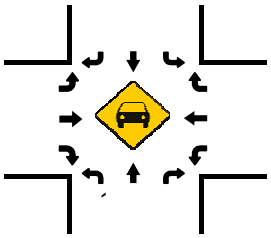
Total Vehicles (NOON)



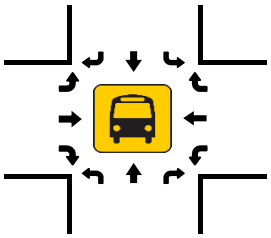
Total Vehicles (NOON)



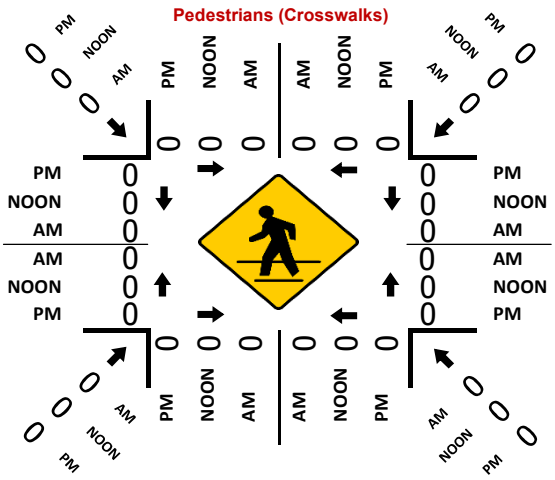
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Dimension Dr & Commercentre Dr

Peak Hour Turning Movement Count

ID: 18-01075-060
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:45 AM - 08:45 AM	07:00 AM - 09:00 AM
NONE	NONE
04:45 PM - 05:45 PM	04:00 PM - 06:00 PM

Dimension Dr — SOUTHBOUND

AM	32	111	31	8	262	AM
NOON	0	0	0	0	0	NOON
PM	13	293	8	20	287	PM
	0	2	1	0		

Commercentre Dr — EASTBOUND

AM	NOON	PM	
388	0	387	
0	0	0	0
10	0	47	1
173	0	14	1
114	0	420	1
AM	NOON	PM	

Commercentre Dr — WESTBOUND

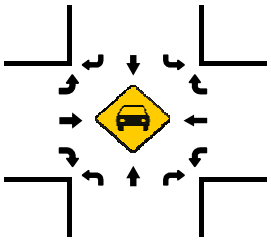
	PM	NOON	AM
0	47	0	10
1	227	0	14
1	254	0	14
0	0	0	0
	44	0	435
	PM	NOON	AM

Dimension Dr — NORTHBOUND

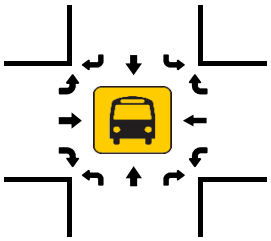
PM	967	0	147	173	22	PM
NOON	0	0	0	0	0	NOON
AM	239	0	342	234	231	AM
		0	1	2	0	

CONTROL			
Signalized			
TEV	1324	0	1685
	AM	NOON	PM
PHF	0.93		0.81

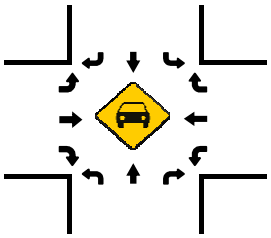
Total Vehicles (AM)



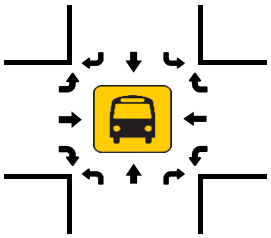
Total Vehicles (AM)



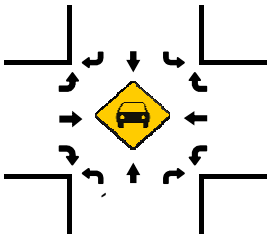
Total Vehicles (NOON)



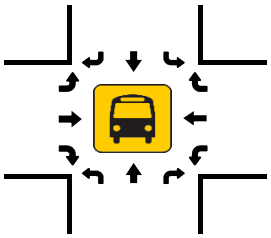
Total Vehicles (NOON)



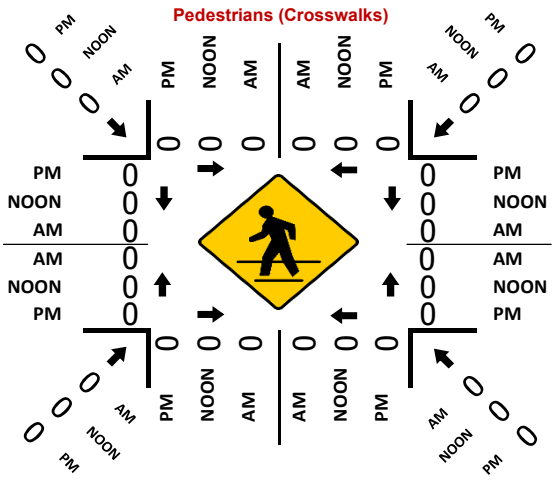
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Lake Forest Dr & Pittsford

Peak Hour Turning Movement Count

ID: 18-01075-101
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Lake Forest Dr — SOUTHBOUND

AM	7	541	65	3	815	AM
NOON	0	0	0	0	0	NOON
PM	28	821	67	4	910	PM

EASTBOUND — Pittsford

AM	NOON	PM	
33	0	69	
0	0	0	0
20	0	20	1
34	0	7	1
32	0	13	0
AM	NOON	PM	

WESTBOUND — Pittsford

PM	NOON	AM	
57	0	108	0
16	0	18	1
121	0	434	1
0	0	0	0
482	0	299	
PM	NOON	AM	

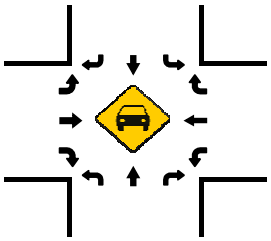
NORTHBOUND — Lake Forest Dr

PM	959	4	25	829	408	PM
NOON	0	0	0	0	0	NOON
AM	1010	3	8	684	200	AM

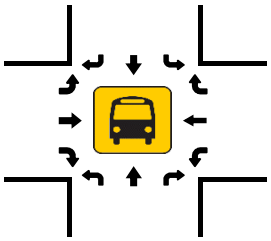
0	2	1	0
0	1	2	0

CONTROL			
Signalized			
TEV	2157	0	2420
	AM	NOON	PM
PHF	0.86		0.98

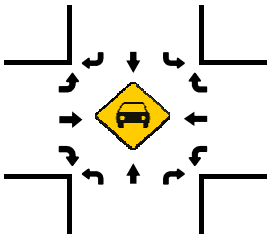
Total Vehicles (AM)



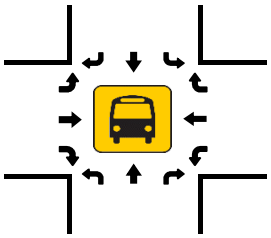
Total Vehicles (AM)



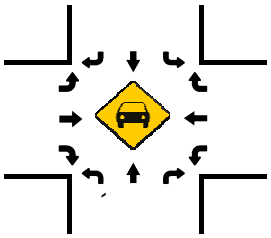
Total Vehicles (NOON)



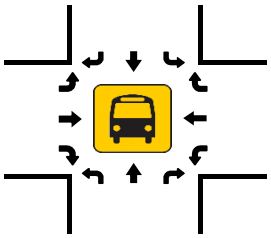
Total Vehicles (NOON)



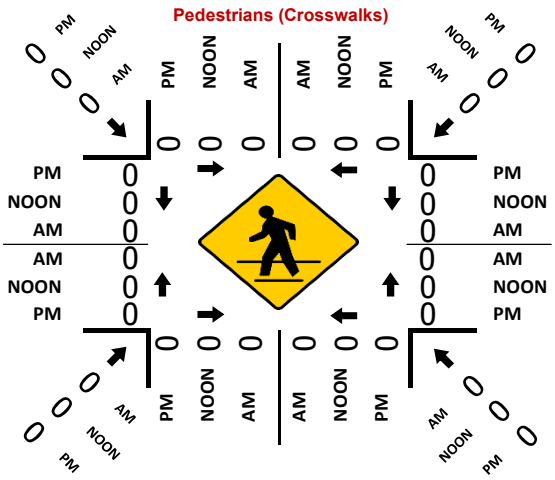
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

El Toro Rd & Northcrest Dr

Peak Hour Turning Movement Count

ID: 18-01075-102
City: Lake Forest

Day: Thursday
Date: 04/19/2018

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

El Toro Rd — SOUTHBOUND

AM	101	1350	0	0	922	AM
NOON	0	0	0	0	0	NOON
PM	43	931	0	0	1314	PM
	0	3	0	0		

Northcrest Dr — EASTBOUND

AM	NOON	PM	
173	0	109	
0	0	0	0
78	0	48	1
0	0	0	1
95	0	35	0
AM	NOON	PM	

Northcrest Dr — WESTBOUND

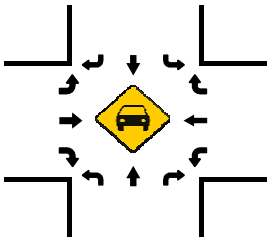
PM	NOON	AM	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	
PM	NOON	AM	

El Toro Rd — NORTHBOUND

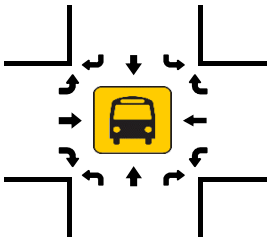
PM	967	1	66	1266	0	PM
NOON	0	0	0	0	0	NOON
AM	1447	2	72	844	0	AM
		0	1	2	0	

CONTROL			
Signalized			
TEV	2542	0	2390
	AM	NOON	PM
PHF	0.87		0.96

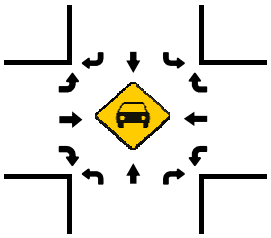
Total Vehicles (AM)



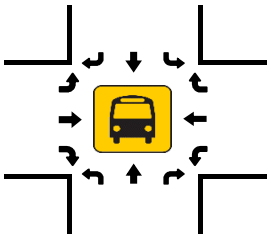
Total Vehicles (AM)



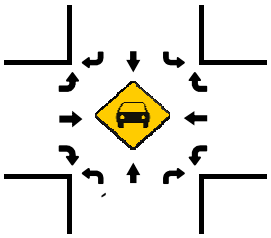
Total Vehicles (NOON)



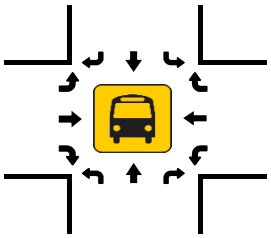
Total Vehicles (NOON)



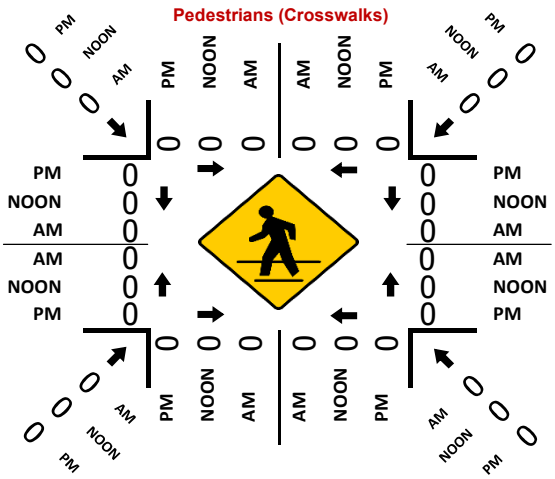
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Appendix 2: Existing (2018) Intersection Level of Service Worksheets

Vistro File: H:\...\Existing_AM.vistro
Report File: H:\...\Ex_AM_LOS.pdf

Scenario: Base Scenario
8/9/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1		Signalized	ICU 1	NWB Left	0.413	-	A
2		Signalized	ICU 1	NWB Thru	0.451	-	A
3		Signalized	ICU 1	NWB Thru	0.442	-	A
4		Signalized	ICU 1	NB Thru	0.361	-	A
5		Signalized	ICU 1	NEB Thru	0.381	-	A
6		Signalized	ICU 1	SWB Thru	0.410	-	A
7		Signalized	ICU 1	NB Thru	0.233	-	A
8		Signalized	ICU 1	NB Thru	0.276	-	A
9		Signalized	ICU 1	SWB Thru	0.468	-	A
10		Signalized	ICU 1	NWB Thru	0.451	-	A
11		Signalized	ICU 1	SWB Thru	0.551	-	A
12		Signalized	ICU 1	NB Right	0.610	-	B
13		Signalized	ICU 1	WB Thru	0.474	-	A
14		Signalized	ICU 1	NEB Right	0.649	-	B
15		Signalized	ICU 1	SWB Thru	0.576	-	A
16		Signalized	ICU 1	NWB Thru	0.433	-	A
17		Signalized	ICU 1	SWB Thru	0.621	-	B
18		Signalized	ICU 1	NEB Thru	0.727	-	C
19		Signalized	ICU 1	SWB Thru	0.530	-	A
20		Signalized	ICU 1	SWB Thru	0.331	-	A
21		Signalized	ICU 1	SWB Thru	0.529	-	A
22		Signalized	ICU 1	NEB Thru	0.917	-	E
23		Signalized	ICU 1	WB Thru	0.637	-	B
24		Signalized	ICU 1	NWB Thru	0.465	-	A
25		Signalized	ICU 1	SWB Thru	0.664	-	B
26		Signalized	ICU 1	SWB Thru	0.646	-	B
27		Signalized	ICU 1	SWB Thru	0.492	-	A
28		Signalized	ICU 1	NWB Thru	0.418	-	A
29		Signalized	ICU 1	SWB Thru	0.605	-	B
30		Signalized	ICU 1	SWB Thru	0.680	-	B
31		Signalized	ICU 1	SWB Right	0.547	-	A
32		Signalized	ICU 1	NWB Thru	0.352	-	A
33		Signalized	ICU 1	SWB Thru	0.563	-	A
34		Signalized	ICU 1	SWB Thru	0.687	-	B
35		Signalized	ICU 1	SWB Thru	0.416	-	A

36		Signalized	ICU 1	WB Thru	0.464	-	A
37		Signalized	ICU 1	SWB Thru	0.479	-	A
38		Signalized	ICU 1	NEB Thru	0.632	-	B
39		Signalized	ICU 1	SWB Thru	0.374	-	A
40		Signalized	ICU 1	NB Thru	0.458	-	A
41		Signalized	ICU 1	SWB Thru	0.458	-	A
42		Signalized	ICU 1	SWB Thru	0.424	-	A
51		Signalized	ICU 1	SWB Thru	0.471	-	A
56		Signalized	ICU 1	SWB Thru	0.444	-	A
57		Signalized	ICU 1	NEB Thru	0.339	-	A
60		Signalized	ICU 1	NWB Thru	0.392	-	A
101		Signalized	ICU 1	WB Left	0.585	-	A
102		Signalized	ICU 1	SWB Thru	0.421	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Generated with PTV VISTRO

Version 7.00-06

Intersection Level Of Service Report

Intersection 1:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.413

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	100.00	150.00	100.00	55.00	315.00	100.00	245.00	170.00	100.00	585.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	35	26	307	187	160	3	538	97	88	3	280	133
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.86	3.85	1.95	2.14	1.88	0.00	2.04	2.06	2.27	0.00	2.14	2.26
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	26	77	187	160	1	538	97	22	3	280	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	7	19	47	40	0	135	24	6	1	70	8
Total Analysis Volume [veh/h]	35	26	77	187	160	1	538	97	22	3	280	33
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Permis	Protect	Permis	Unsign	Protect	Permis	Unsign
Signal Group	7	4	0	3	8	8	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.00	0.11	0.05	0.00	0.16	0.02	0.00	0.00	0.08	0.00
Intersection LOS	A											
Intersection V/C	0.413											

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Intersection Level Of Service Report

Intersection 2:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.451

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	190.00	100.00	180.00	285.00	100.00	285.00	230.00	100.00	100.00	230.00	100.00	220.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	47	190	109	129	382	282	368	532	64	290	355	91
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.13	2.11	1.83	2.33	2.09	2.13	1.90	2.07	1.56	2.07	1.97	2.20
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	190	27	129	382	70	368	532	64	290	355	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	48	7	32	96	18	92	133	16	73	89	6
Total Analysis Volume [veh/h]	47	190	27	129	382	70	368	532	64	290	355	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.06	0.02	0.08	0.11	0.04	0.11	0.18	0.18	0.09	0.07	0.01
Intersection LOS	A											
Intersection V/C	0.451											

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Intersection Level Of Service Report

Intersection 3:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.442

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	195.00	100.00	295.00	110.00	100.00	425.00	300.00	100.00	100.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	32	152	128	191	177	4	235	916	247	22	531	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.13	1.97	2.34	2.09	2.26	0.00	2.13	1.97	2.02	0.00	2.07	1.79
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	152	32	191	177	1	235	916	247	22	531	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	38	8	48	44	0	59	229	62	6	133	4
Total Analysis Volume [veh/h]	32	152	32	191	177	1	235	916	247	22	531	14
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.04	0.02	0.11	0.05	0.00	0.07	0.23	0.23	0.01	0.10	0.01
Intersection LOS	A											
Intersection V/C	0.442											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 4:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.361

Intersection Setup

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Approach	Northbound			Westbound			Northeastbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left2	Left	Thru	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	0	0	0	2	0	1
Pocket Length [ft]	200.00	100.00	100.00	215.00	100.00	345.00	100.00	100.00	100.00	515.00	100.00	185.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Base Volume Input [veh/h]	130	985	261	300	70	702	74	24	70	252	491	105
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.31	2.03	1.92	2.00	1.43	1.99	1.35	0.00	1.43	1.98	2.04	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	985	65	300	70	702	74	24	70	252	491	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	246	16	75	18	176	19	6	18	63	123	7
Total Analysis Volume [veh/h]	130	985	65	300	70	702	74	24	70	252	491	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Protect	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	1	1	6	0	5	2	2	7	4	4
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	Lag	-	Lead	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.19	0.00	0.09	0.02	0.00	0.04	0.03	0.03	0.07	0.10	0.02
Intersection LOS	A											
Intersection V/C	0.361											

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Intersection Level Of Service Report

Intersection 5:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.381

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	0	0	2	0	0	1
Pocket Length [ft]	535.00	100.00	300.00	620.00	100.00	70.00	100.00	100.00	555.00	100.00	100.00	730.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	123	564	197	372	961	66	151	0	319	102	0	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.63	1.95	2.03	1.88	1.98	1.52	1.99	0.00	1.88	1.96	0.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	564	49	372	961	16	151	0	80	102	0	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	141	12	93	240	4	38	0	20	26	0	9
Total Analysis Volume [veh/h]	123	564	49	372	961	16	151	0	80	102	0	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	212
Lost time [s]	11.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.11	0.00	0.11	0.19	0.00	0.04	0.00	0.00	0.06	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.381											

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Intersection Level Of Service Report
Intersection 6:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.410

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	2	1	0	1
Pocket Length [ft]	170.00	100.00	100.00	370.00	100.00	100.00	100.00	100.00	435.00	550.00	100.00	550.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	123	397	82	52	666	280	333	0	67	184	0	469
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.63	2.02	2.44	1.92	1.95	2.14	2.10	0.00	1.49	2.17	0.00	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	397	20	52	666	70	333	0	17	184	0	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	99	5	13	167	18	83	0	4	46	0	29
Total Analysis Volume [veh/h]	123	397	20	52	666	70	333	0	17	184	0	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.08	0.00	0.03	0.13	0.00	0.10	0.00	0.00	0.05	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.410											

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Intersection Level Of Service Report
Intersection 7:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.233

Intersection Setup

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Approach	Northbound		Eastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Left	Right	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	1
Pocket Length [ft]	355.00	100.00	100.00	100.00	100.00	395.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Base Volume Input [veh/h]	155	621	0	0	451	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	1.93	0.00	0.00	2.00	1.87
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	155	621	0	0	451	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	155	0	0	113	7
Total Analysis Volume [veh/h]	155	621	0	0	451	27
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	0	0	6	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.18	0.00	0.00	0.13	0.02
Intersection LOS	A					
Intersection V/C	0.233					

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Intersection Level Of Service Report
Intersection 8:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.276

Intersection Setup

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Approach	Northbound		Southbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	655.00	365.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Base Volume Input [veh/h]	0	600	448	0	168	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.01	0.00	1.79	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	600	448	0	168	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	150	112	0	42	11
Total Analysis Volume [veh/h]	0	600	448	0	168	42
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	0	2	6	0	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.18	0.13	0.00	0.05	0.02
Intersection LOS	A					
Intersection V/C	0.276					

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Version 7.00-06

Intersection Level Of Service Report
Intersection 9:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.468

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	1
Pocket Length [ft]	100.00	230.00	390.00	100.00	185.00	145.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Base Volume Input [veh/h]	584	226	98	891	531	121
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.05	2.21	2.04	2.02	2.07	1.65
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	584	57	98	891	531	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	146	14	25	223	133	8
Total Analysis Volume [veh/h]	584	57	98	891	531	30
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.17	0.03	0.06	0.26	0.16	0.01
Intersection LOS	A					
Intersection V/C	0.468					

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Version 7.00-06

Intersection Level Of Service Report

Intersection 10:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.451

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	2	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	340.00	100.00	200.00	250.00	100.00	110.00	245.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Base Volume Input [veh/h]	120	487	44	124	526	156	251	563	40	18	190	49
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	2.05	2.27	1.61	2.09	1.92	1.99	1.95	2.50	0.00	2.11	2.04
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	487	11	124	526	39	251	563	10	18	190	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	122	3	31	132	10	63	141	3	5	48	12
Total Analysis Volume [veh/h]	120	487	11	124	526	39	251	563	10	18	190	49
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.14	0.01	0.07	0.15	0.02	0.07	0.17	0.01	0.01	0.07	0.07
Intersection LOS	A											
Intersection V/C	0.451											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 11:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.551

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy. S.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	1	0
Pocket Length [ft]	190.00	100.00	100.00	80.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy. S.	
Base Volume Input [veh/h]	237	683	1112	302	119	139
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.11	2.05	1.98	1.99	1.68	2.16
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	237	683	1112	78	119	32
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	59	171	278	20	30	8
Total Analysis Volume [veh/h]	237	683	1112	78	119	32
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.20	0.33	0.05	0.04	0.02
Intersection LOS	A					
Intersection V/C	0.551					

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Version 7.00-06

Intersection Level Of Service Report

Intersection 12:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.610

Intersection Setup

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	1	0	1	1	0	2
Pocket Length [ft]	400.00	100.00	100.00	200.00	100.00	100.00	395.00	100.00	260.00	150.00	100.00	170.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Base Volume Input [veh/h]	440	1551	35	73	609	220	321	180	450	30	596	376
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.05	2.00	2.86	1.37	1.97	1.82	1.87	2.22	2.00	3.33	2.01	2.13
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	440	1551	35	73	609	53	321	180	112	30	596	95
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	388	9	18	152	13	80	45	28	8	149	24
Total Analysis Volume [veh/h]	440	1551	35	73	609	53	321	180	112	30	596	95
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.23	0.23	0.02	0.12	0.03	0.19	0.04	0.07	0.02	0.12	0.06
Intersection LOS	B											
Intersection V/C	0.610											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 13:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.474

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Thru	Right	Right2	Left2	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	0
Pocket Length [ft]	285.00	100.00	180.00	285.00	100.00	220.00	345.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Base Volume Input [veh/h]	34	960	111	66	819	495	114	73	3	94	288	62
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.94	1.98	1.80	1.52	1.95	2.02	1.75	1.37	0.00	2.13	2.08	1.61
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	960	28	66	819	114	114	73	3	94	288	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	240	7	17	205	29	29	18	1	24	72	16
Total Analysis Volume [veh/h]	34	960	28	66	819	114	114	73	3	94	288	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Permis	Protect	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.28	0.02	0.04	0.24	0.07	0.03	0.04	0.04	0.06	0.08	0.10
Intersection LOS	A											
Intersection V/C	0.474											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 14:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.649

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	305.00	100.00	100.00	305.00	100.00	150.00	305.00	100.00	225.00	275.00	100.00	275.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Base Volume Input [veh/h]	218	1632	120	63	930	86	668	543	155	138	206	213
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.83	2.02	1.67	1.59	2.04	2.33	1.95	2.03	1.94	2.17	1.94	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	218	1632	120	63	930	21	668	543	39	138	206	53
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	408	30	16	233	5	167	136	10	35	52	13
Total Analysis Volume [veh/h]	218	1632	120	63	930	21	668	543	39	138	206	53
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.34	0.34	0.02	0.18	0.01	0.20	0.11	0.02	0.04	0.04	0.03
Intersection LOS	B											
Intersection V/C	0.649											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 15:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Approach	Northbound			Northeastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	0	2	0	1
Pocket Length [ft]	210.00	100.00	280.00	275.00	100.00	405.00	160.00	100.00	100.00	175.00	100.00	225.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Base Volume Input [veh/h]	459	724	370	179	780	129	210	1105	138	134	481	258
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	1.93	1.89	2.23	2.05	2.33	1.90	1.99	2.17	2.24	2.08	1.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	459	724	92	179	780	32	210	1105	138	134	481	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	181	23	45	195	8	53	276	35	34	120	16
Total Analysis Volume [veh/h]	459	724	92	179	780	32	210	1105	138	134	481	64
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	5	2	2	1	6	6	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.14	0.05	0.05	0.15	0.02	0.06	0.24	0.24	0.04	0.09	0.04
Intersection LOS	A											
Intersection V/C	0.576											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 16:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.433

Intersection Setup

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Approach	Southbound		Northeastbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	0	0	1	0
Pocket Length [ft]	100.00	200.00	100.00	100.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Base Volume Input [veh/h]	629	191	188	216	171	1390
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.07	2.09	2.13	1.85	1.75	2.01
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	629	48	188	54	171	1390
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	157	12	47	14	43	348
Total Analysis Volume [veh/h]	629	48	188	54	171	1390
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Split	Split	Protected	Permissive
Signal Group	4	4	2	2	3	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lag	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.03	0.11	0.03	0.10	0.27
Intersection LOS	A					
Intersection V/C	0.433					

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Intersection Level Of Service Report
Intersection 17:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.621

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	360.00	100.00	305.00	165.00	100.00	175.00	225.00	100.00	230.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Base Volume Input [veh/h]	197	674	173	251	1495	276	287	832	204	194	374	185
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	1.93	1.73	1.99	2.01	2.17	2.09	2.04	1.96	2.06	1.87	2.16
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	197	674	43	251	1495	70	287	832	51	194	374	185
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	169	11	63	374	18	72	208	13	49	94	46
Total Analysis Volume [veh/h]	197	674	43	251	1495	70	287	832	51	194	374	185
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3			6,7						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.13	0.00	0.07	0.29	0.00	0.08	0.16	0.03	0.06	0.11	0.11
Intersection LOS	B											
Intersection V/C	0.621											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 18:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.727

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	180.00	100.00	205.00	205.00	100.00	225.00	285.00	100.00	100.00	205.00	100.00	110.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	298	1935	51	65	1685	141	273	185	85	32	36	38
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.01	2.02	1.96	1.54	2.02	2.13	1.83	2.16	2.35	3.13	2.78	2.63
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	298	1935	13	65	1685	35	273	185	85	32	36	9
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	484	3	16	421	9	68	46	21	8	9	2
Total Analysis Volume [veh/h]	298	1935	13	65	1685	35	273	185	85	32	36	9
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.38	0.01	0.04	0.33	0.02	0.16	0.08	0.08	0.01	0.01	0.01
Intersection LOS	C											
Intersection V/C	0.727											

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Intersection Level Of Service Report

Intersection 19:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.530

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Approach	Eastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	185.00	180.00	100.00	200.00	155.00	100.00	100.00	135.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	79	974	57	42	1553	67	130	233	51	23	87	91
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.53	1.95	1.75	2.38	2.00	1.49	2.31	2.15	1.96	0.00	2.30	2.20
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	974	14	42	1553	17	130	233	51	23	87	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	244	4	11	388	4	33	58	13	6	22	23
Total Analysis Volume [veh/h]	79	974	14	42	1553	17	130	233	51	23	87	91
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.19	0.01	0.02	0.30	0.01	0.08	0.08	0.08	0.01	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.530											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 20:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.331

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	110.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	37	227	123	92	378	83	126	228	50	29	134	32
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.70	2.20	1.63	2.17	2.12	2.41	2.38	2.19	2.00	3.45	2.24	3.13
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	227	123	92	378	83	126	228	50	29	134	32
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	57	31	23	95	21	32	57	13	7	34	8
Total Analysis Volume [veh/h]	37	227	123	92	378	83	126	228	50	29	134	32
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	157
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.10	0.10	0.05	0.14	0.14	0.07	0.08	0.08	0.02	0.05	0.05
Intersection LOS	A											
Intersection V/C	0.331											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 21:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.529

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	250.00	100.00	250.00	210.00	100.00	1000.0	100.00	100.00	25.00	170.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	154	983	20	2	1698	239	29	21	5	79	3	176
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.95	2.03	0.00	0.00	2.00	2.09	3.45	0.00	0.00	2.53	0.00	2.27
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	983	5	2	1698	60	29	21	1	79	3	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	246	1	1	425	15	7	5	0	20	1	11
Total Analysis Volume [veh/h]	154	983	5	2	1698	60	29	21	1	79	3	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.19	0.00	0.00	0.33	0.04	0.02	0.03	0.00	0.02	0.02	0.03
Intersection LOS	A											
Intersection V/C	0.529											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 22:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.917

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	350.00	100.00	190.00	285.00	100.00	200.00	255.00	100.00	100.00	150.00	100.00	80.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	411	2112	80	56	1913	59	397	432	99	8	49	111
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.95	1.99	2.50	1.79	1.99	1.69	2.02	2.08	2.02	0.00	2.04	1.80
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	411	2112	20	56	1913	15	397	432	99	8	49	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	103	528	5	14	478	4	99	108	25	2	12	7
Total Analysis Volume [veh/h]	411	2112	20	56	1913	15	397	432	99	8	49	28
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.24	0.41	0.01	0.03	0.38	0.01	0.23	0.16	0.16	0.00	0.01	0.02
Intersection LOS	E											
Intersection V/C	0.917											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 23:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	195.00	100.00	300.00	255.00	100.00	275.00	240.00	100.00	100.00	190.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	220	1257	326	95	795	151	242	535	272	80	166	83
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.99	2.15	2.11	2.01	1.99	2.07	2.06	1.84	2.50	1.81	2.41
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	1257	81	95	795	40	242	535	272	80	166	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	314	20	24	199	10	61	134	68	20	42	21
Total Analysis Volume [veh/h]	220	1257	81	95	795	40	242	535	272	80	166	83
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.25	0.05	0.06	0.16	0.02	0.14	0.24	0.24	0.05	0.07	0.07
Intersection LOS	B											
Intersection V/C	0.637											

Intersection Level Of Service Report
Intersection 24:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.465

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	115.00	175.00	100.00	95.00	95.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	66	223	128	116	285	210	112	708	73	92	351	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.52	1.79	2.34	1.72	2.11	1.90	1.79	1.98	1.37	2.17	1.99	1.71
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	66	223	40	116	285	52	112	708	73	92	351	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	56	10	29	71	13	28	177	18	23	88	29
Total Analysis Volume [veh/h]	66	223	40	116	285	52	112	708	73	92	351	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	105
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.07	0.02	0.07	0.08	0.03	0.07	0.23	0.23	0.05	0.14	0.14
Intersection LOS	A											
Intersection V/C	0.465											

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Intersection Level Of Service Report
Intersection 25:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.664

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	0
Pocket Length [ft]	195.00	100.00	125.00	360.00	100.00	575.00	155.00	100.00	145.00	180.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	98	822	256	262	1521	226	400	508	245	130	302	174
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.04	1.95	1.95	1.91	1.97	2.21	2.00	1.97	2.04	2.31	1.99	1.72
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	822	64	262	1521	56	400	508	61	130	302	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	206	16	66	380	14	100	127	15	33	76	44
Total Analysis Volume [veh/h]	98	822	64	262	1521	56	400	508	61	130	302	174
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.16	0.00	0.15	0.30	0.03	0.12	0.15	0.04	0.08	0.14	0.14
Intersection LOS	B											
Intersection V/C	0.664											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 26:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.646

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	285.00	100.00	100.00	295.00	100.00	110.00	180.00	100.00	175.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	192	624	205	319	1258	320	245	623	110	162	560	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.08	1.92	1.95	1.88	1.99	1.88	2.04	1.93	1.82	1.85	1.96	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	192	624	51	319	1258	80	245	623	27	162	560	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	156	13	80	315	20	61	156	7	41	140	12
Total Analysis Volume [veh/h]	192	624	51	319	1258	80	245	623	27	162	560	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.12	0.03	0.19	0.25	0.05	0.07	0.18	0.02	0.05	0.16	0.03
Intersection LOS	B											
Intersection V/C	0.646											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 27:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.492

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	295.00	100.00	285.00	235.00	100.00	290.00	245.00	100.00	210.00	185.00	100.00	255.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	61	781	132	110	1291	172	291	528	176	54	166	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.64	2.05	2.27	1.82	2.01	1.74	2.06	2.08	2.27	1.85	1.81	2.27
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	781	33	110	1291	43	291	528	44	54	166	11
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	195	8	28	323	11	73	132	11	14	42	3
Total Analysis Volume [veh/h]	61	781	33	110	1291	43	291	528	44	54	166	11
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.15	0.02	0.03	0.25	0.03	0.09	0.16	0.03	0.02	0.05	0.00
Intersection LOS	A											
Intersection V/C	0.492											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 28:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.418

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	185.00	100.00	190.00	175.00	100.00	200.00	180.00	100.00	95.00	300.00	100.00	125.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	79	169	81	117	236	104	76	767	89	41	326	41
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.53	1.78	2.47	1.71	2.12	1.92	2.63	1.96	2.25	2.44	2.15	2.44
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	169	20	117	236	26	76	767	22	41	326	10
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	42	5	29	59	7	19	192	6	10	82	3
Total Analysis Volume [veh/h]	79	169	20	117	236	26	76	767	22	41	326	10
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.05	0.01	0.07	0.07	0.02	0.04	0.23	0.01	0.02	0.10	0.01
Intersection LOS	A											
Intersection V/C	0.418											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 29:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	245.00	100.00	100.00	150.00	100.00	345.00	215.00	100.00	120.00	170.00	100.00	295.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	115	790	146	226	1478	326	348	608	215	177	298	182
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.74	2.03	2.05	2.21	2.03	2.15	2.01	1.97	1.86	2.26	2.01	2.20
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	115	790	36	226	1478	82	348	608	54	177	298	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	198	9	57	370	21	87	152	14	44	75	11
Total Analysis Volume [veh/h]	115	790	36	226	1478	82	348	608	54	177	298	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.15	0.02	0.07	0.29	0.05	0.10	0.18	0.03	0.05	0.09	0.03
Intersection LOS	B											
Intersection V/C	0.605											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 30:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.680

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Pocket Length [ft]	210.00	100.00	410.00	190.00	100.00	125.00	250.00	100.00	145.00	305.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	212	656	221	301	1015	332	194	506	121	138	471	182
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.89	1.98	1.81	1.99	1.97	2.11	2.06	1.98	1.65	2.17	1.91	2.20
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	212	656	55	301	1015	83	194	506	121	138	471	182
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	164	14	75	254	21	49	127	30	35	118	46
Total Analysis Volume [veh/h]	212	656	55	301	1015	83	194	506	121	138	471	182
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.13	0.03	0.18	0.20	0.05	0.11	0.15	0.07	0.08	0.19	0.19
Intersection LOS	B											
Intersection V/C	0.680											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 31:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.547

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	1	2	0	1	2	0	2
Pocket Length [ft]	225.00	100.00	290.00	165.00	100.00	180.00	260.00	100.00	155.00	145.00	100.00	250.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	480	921	208	136	1341	85	393	270	112	40	103	255
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.08	1.95	1.92	2.21	2.01	2.35	2.04	1.85	1.79	2.50	1.94	1.96
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	480	921	52	136	1341	85	393	270	28	40	103	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	120	230	13	34	335	21	98	68	7	10	26	16
Total Analysis Volume [veh/h]	480	921	52	136	1341	85	393	270	28	40	103	64
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.18	0.03	0.04	0.21	0.21	0.12	0.08	0.02	0.01	0.03	0.00
Intersection LOS	A											
Intersection V/C	0.547											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 32:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.352

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00	255.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	45	46	40	91	19	181	18	402	64	74	280	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.22	2.17	2.50	2.20	0.00	2.21	0.00	1.99	1.56	1.35	2.14	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	45	46	40	91	19	181	18	402	64	74	280	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	12	10	23	5	45	5	101	16	19	70	5
Total Analysis Volume [veh/h]	45	46	40	91	19	181	18	402	64	74	280	19
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	149
Lost time [s]	7.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	5	5	6	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.04	0.04	0.05	0.09	0.09	0.01	0.14	0.14	0.04	0.09	0.09
Intersection LOS	A											
Intersection V/C	0.352											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 33:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.563

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	2	0	1	2	0	1
Pocket Length [ft]	250.00	100.00	235.00	200.00	100.00	100.00	195.00	100.00	200.00	245.00	100.00	155.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	326	876	158	169	1552	64	396	249	153	83	214	217
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.15	2.05	1.90	1.78	2.00	1.56	2.02	2.01	1.96	2.41	1.87	1.84
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	326	876	39	169	1552	64	396	249	38	83	214	54
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	82	219	10	42	388	16	99	62	10	21	54	14
Total Analysis Volume [veh/h]	326	876	39	169	1552	64	396	249	38	83	214	54
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Unsign
Signal Group	5	2	2	1	6	6	3	8	8	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.13	0.02	0.05	0.24	0.24	0.12	0.07	0.02	0.02	0.06	0.00
Intersection LOS	A											
Intersection V/C	0.563											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 34:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	160.00	100.00	100.00	100.00	100.00	50.00	250.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	195	739	3	11	911	490	12	43	42	253	12	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.05	2.03	0.00	0.00	1.98	2.04	0.00	2.33	2.38	1.98	0.00	2.04
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	195	739	3	11	911	490	12	43	42	253	12	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	185	1	3	228	123	3	11	11	63	3	12
Total Analysis Volume [veh/h]	195	739	3	11	911	490	12	43	42	253	12	49
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	131
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.22	0.22	0.01	0.41	0.41	0.01	0.03	0.03	0.07	0.08	0.03
Intersection LOS	B											
Intersection V/C	0.687											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 35:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.416

Intersection Setup

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Approach	Northbound			Eastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	640.00	100.00	640.00	190.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Base Volume Input [veh/h]	526	0	513	0	1215	0	0	1090	942	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.09	0.00	1.95	0.00	1.98	0.00	0.00	2.02	2.02	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	526	0	128	0	1215	0	0	1090	235	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	132	0	32	0	304	0	0	273	59	0	0	0
Total Analysis Volume [veh/h]	526	0	128	0	1215	0	0	1090	235	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	8	0	8	0	2	0	0	6	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.00	0.04	0.00	0.18	0.00	0.00	0.21	0.14	0.00	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.416											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 36:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.464

Intersection Setup

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	125.00	100.00	100.00	100.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	465.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	107	0	147	667	319	700	0	855	57	255	985	372
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.87	0.00	2.04	1.95	1.88	2.00	0.00	1.99	1.75	1.96	2.03	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	0	147	667	319	175	0	855	57	255	985	93
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	0	37	167	80	44	0	214	14	64	246	23
Total Analysis Volume [veh/h]	107	0	147	667	319	175	0	855	57	255	985	93
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Permis	Permis	Permis	Protect	Permis	Permis
Signal Group	8	0	1	4	4	4	0	2	2	1	6	0
Auxiliary Signal Groups			1									
Lead / Lag	Lag	-	-	Lag	-	-	-	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.13	0.15	0.10	0.00	0.13	0.13	0.08	0.19	0.05
Intersection LOS	A											
Intersection V/C	0.464											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 37:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.479

Intersection Setup

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	2	1	0	1	2	0	1
Pocket Length [ft]	145.00	100.00	100.00	100.00	100.00	265.00	35.00	100.00	120.00	135.00	100.00	45.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	129	35	29	784	773	34	9	376	469	148	199	94
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.33	2.86	3.45	2.04	1.94	2.94	0.00	2.13	1.92	2.03	2.01	2.13
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	35	7	784	773	34	9	376	117	148	199	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	9	2	196	193	9	2	94	29	37	50	24
Total Analysis Volume [veh/h]	129	35	7	784	773	34	9	376	117	148	199	94
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Protect	Permis	Protect	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	8	1	6	6
Auxiliary Signal Groups			4,5									
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.02	0.00	0.23	0.24	0.24	0.01	0.11	0.07	0.04	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.479											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 38:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	1
Pocket Length [ft]	110.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	410.00	165.00	100.00	165.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Base Volume Input [veh/h]	123	1803	1592	0	2270	92	460	52	350	38	2	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.63	2.00	2.01	0.00	1.98	2.17	1.96	1.92	2.00	2.63	0.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	123	1803	398	0	2270	92	460	52	350	38	2	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	451	100	0	568	23	115	13	88	10	1	38
Total Analysis Volume [veh/h]	123	1803	398	0	2270	92	460	52	350	38	2	150
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.35	0.23	0.00	0.28	0.28	0.14	0.00	0.21	0.02	0.00	0.02
Intersection LOS	B											
Intersection V/C	0.632											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 39:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.374

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	2	0	1	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	305.00	100.00	135.00	215.00	100.00	100.00	215.00	100.00	90.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	0	1058	21	118	944	742	34	109	371	668	251	105
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.98	0.00	1.69	2.01	2.02	2.94	1.83	1.89	1.95	1.99	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1058	21	118	944	185	34	109	93	668	251	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	265	5	30	236	46	9	27	23	167	63	7
Total Analysis Volume [veh/h]	0	1058	21	118	944	185	34	109	93	668	251	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Protect	Permis	Permis	Permis	Permis	Overla	Split	Split	Split
Signal Group	0	2	2	1	6	6	8	8	1	4	4	4
Auxiliary Signal Groups									1,8			
Lead / Lag	-	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.16	0.16	0.03	0.19	0.11	0.02	0.08	0.00	0.13	0.07	0.02
Intersection LOS	A											
Intersection V/C	0.374											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 40:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.458

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	0	0	1	1	0	0
Pocket Length [ft]	295.00	100.00	195.00	135.00	100.00	100.00	100.00	100.00	95.00	165.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Base Volume Input [veh/h]	795	1260	13	42	667	162	7	26	29	62	55	269
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.01	1.98	0.00	2.38	1.95	1.85	0.00	3.85	3.45	1.61	1.82	1.86
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	795	1260	3	42	667	40	7	26	7	62	55	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	199	315	1	11	167	10	2	7	2	16	14	17
Total Analysis Volume [veh/h]	795	1260	3	42	667	40	7	26	7	62	55	67
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	182
Lost time [s]	9.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Protect	Permis	Permis	Permis	Split	Split	Split
Signal Group	5	2	2	1	6	4	8	8	1	4	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.23	0.25	0.00	0.01	0.13	0.02	0.00	0.01	0.00	0.02	0.03	0.04
Intersection LOS	A											
Intersection V/C	0.458											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 41:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.458

Intersection Setup

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Approach	Southbound			Northeastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	200.00	100.00	205.00	225.00	100.00	230.00	260.00	100.00	155.00	245.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Base Volume Input [veh/h]	34	26	210	83	481	114	134	1207	55	149	29	26
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.94	3.85	1.90	2.41	2.08	1.75	2.24	1.99	1.82	2.01	3.45	3.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	26	52	83	481	28	134	1207	14	149	29	6
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	7	13	21	120	7	34	302	4	37	7	2
Total Analysis Volume [veh/h]	34	26	52	83	481	28	134	1207	14	149	29	6
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	7	4	4	5	2	2	1	6	6	3	8	8
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.03	0.05	0.09	0.02	0.04	0.24	0.01	0.09	0.01	0.00
Intersection LOS	A											
Intersection V/C	0.458											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 42:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.424

Intersection Setup

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Approach	Eastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	2	0
Pocket Length [ft]	100.00	100.00	305.00	100.00	260.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Base Volume Input [veh/h]	556	336	151	1591	194	34
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.98	2.08	1.99	2.01	2.06	2.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	556	336	151	1591	194	8
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	139	84	38	398	49	2
Total Analysis Volume [veh/h]	556	336	151	1591	194	8
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	8	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.17	0.17	0.09	0.31	0.06	0.00
Intersection LOS	A					
Intersection V/C	0.424					

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Intersection Level Of Service Report
Intersection 51:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.471

Intersection Setup

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Approach	Eastbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	255.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Base Volume Input [veh/h]	54	180	223	366	655	233
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.85	2.22	1.79	1.91	1.98	2.15
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	54	45	223	366	655	233
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	11	56	92	164	58
Total Analysis Volume [veh/h]	54	45	223	366	655	233
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	7	5	5	2	6	6
Auxiliary Signal Groups		5				
Lead / Lag	Lag	-	Lead	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.13	0.22	0.26	0.26
Intersection LOS	A					
Intersection V/C	0.471					

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Version 7.00-06

Intersection Level Of Service Report

Intersection 56:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.444

Intersection Setup

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Approach	Northbound			Southbound			Eastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	2	1	0	1	1	0	1
Pocket Length [ft]	170.00	100.00	170.00	100.00	100.00	165.00	290.00	100.00	225.00	295.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Base Volume Input [veh/h]	53	23	119	92	61	80	19	713	105	191	1019	69
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.89	0.00	1.68	2.17	1.64	2.50	0.00	1.96	1.90	2.09	1.96	1.45
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	23	30	92	61	20	19	713	26	191	1019	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	6	8	23	15	5	5	178	7	48	255	4
Total Analysis Volume [veh/h]	53	23	30	92	61	20	19	713	26	191	1019	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.01	0.02	0.05	0.04	0.01	0.01	0.21	0.02	0.11	0.30	0.01
Intersection LOS	A											
Intersection V/C	0.444											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 57:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.339

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	140.00	100.00	175.00	105.00	100.00	200.00	100.00	100.00	35.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Base Volume Input [veh/h]	184	682	4	18	443	417	5	2	2	159	3	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.17	2.05	0.00	0.00	2.03	1.92	0.00	0.00	0.00	1.89	0.00	1.64
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	184	682	1	18	443	104	5	2	2	159	3	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	46	171	0	5	111	26	1	1	1	40	1	4
Total Analysis Volume [veh/h]	184	682	1	18	443	104	5	2	2	159	3	15
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.20	0.00	0.01	0.13	0.06	0.00	0.00	0.00	0.05	0.05	0.01
Intersection LOS	A											
Intersection V/C	0.339											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 60:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.392

Intersection Setup

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Approach	Southbound			Eastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left2	Left	Right	Left2	Left	Thru	Left	Thru	Right	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	210.00	100.00	100.00	140.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Base Volume Input [veh/h]	39	111	32	10	173	114	14	14	10	342	234	231
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.56	1.80	3.13	0.00	1.73	1.75	0.00	0.00	0.00	2.05	2.14	2.16
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	39	111	32	10	173	114	14	14	10	342	234	231
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	28	8	3	43	29	4	4	3	86	59	58
Total Analysis Volume [veh/h]	39	111	32	10	173	114	14	14	10	342	234	231
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	129
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis
Signal Group	1	6	6	4	4	4	8	8	8	5	2	2
Auxiliary Signal Groups												
Lead / Lag	Lead	Lag	-	Lag	Lag	-	Lag	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.03	0.04	0.01	0.10	0.07	0.01	0.01	0.01	0.20	0.14	0.14
Intersection LOS	A											
Intersection V/C	0.392											

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Version 7.00-06

Intersection Level Of Service Report

Intersection 101:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.585

Intersection Setup

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Approach	Eastbound			Westbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	1
Pocket Length [ft]	65.00	100.00	100.00	60.00	100.00	100.00	150.00	100.00	190.00	155.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	20	34	32	434	18	108	11	684	200	68	541	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.94	3.13	2.07	0.00	1.85	0.00	2.05	2.00	1.47	2.03	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	34	32	434	18	108	11	684	27	68	541	2
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	9	8	109	5	27	3	171	7	17	135	1
Total Analysis Volume [veh/h]	20	34	32	434	18	108	11	684	27	68	541	2
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	101
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.04	0.04	0.26	0.07	0.07	0.01	0.20	0.02	0.04	0.16	0.00
Intersection LOS	A											
Intersection V/C	0.585											

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Version 7.00-06

Intersection Level Of Service Report
Intersection 102:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.421

Intersection Setup

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Base Volume Input [veh/h]	74	844	1350	101	78	95
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.35	2.01	2.00	1.98	2.56	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	844	1350	101	78	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	211	338	25	20	6
Total Analysis Volume [veh/h]	74	844	1350	101	78	24
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Overlap
Signal Group	5	2	6	6	7	5
Auxiliary Signal Groups						5
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.25	0.28	0.28	0.05	0.00
Intersection LOS	A					
Intersection V/C	0.421					

Vistro File: H:\...\Existing_AM.vistro
Report File: H:\...\Ex_AM_LOS.pdf

Scenario: Base Scenario
8/9/2019

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		35	26	307	187	160	3	538	97	88	3	280	133	1857

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		47	190	109	129	382	282	368	532	64	290	355	91	2839

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		32	152	128	191	177	4	235	916	247	22	531	56	2691

ID	Intersection Name	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
		Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		130	985	261	300	70	702	74	24	70	252	491	105	3464

ID	Intersection Name	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		123	564	197	372	961	66	151	319	102	150	3005

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		123	397	82	52	666	280	333	67	184	469	2653

ID	Intersection Name	Northbound		Southwestbound		Total Volume
		Left	Thru	Thru	Right	
7		155	621	451	107	1334

ID	Intersection Name	Northbound	Southbound	Southeastbound		Total Volume
		Thru	Thru	Left	Right	
8		600	448	168	170	1386

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
9		584	226	98	891	531	121	2451

ID	Intersection Name	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		120	487	44	124	526	156	251	563	40	18	190	49	2568

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
11		237	683	1112	302	119	139	2592

ID	Intersection Name	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		440	1551	35	73	609	220	321	180	450	30	596	376	4881

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		34	960	111	66	819	495	114	73	3	94	288	62	3119

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		218	1632	120	63	930	86	668	543	155	138	206	213	4972

ID	Intersection Name	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		459	724	370	179	780	129	210	1105	138	134	481	258	4967

ID	Intersection Name	Southbound		Northeastbound		Northwestbound		Total Volume
		Thru	Right	Left	Right	Left	Thru	
16		629	191	188	216	171	1390	2785

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		197	674	173	251	1495	276	287	832	204	194	374	185	5142

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		298	1935	51	65	1685	141	273	185	85	32	36	38	4824

ID	Intersection Name	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		79	974	57	42	1553	67	130	233	51	23	87	91	3387

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		37	227	123	92	378	83	126	228	50	29	134	32	1539

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		154	983	20	2	1698	239	29	21	5	79	3	176	3409

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		411	2112	80	56	1913	59	397	432	99	8	49	111	5727

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		220	1257	326	95	795	151	242	535	272	80	166	83	4222

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		66	223	128	116	285	210	112	708	73	92	351	117	2481

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		98	822	256	262	1521	226	400	508	245	130	302	174	4944

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		192	624	205	319	1258	320	245	623	110	162	560	190	4808

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		61	781	132	110	1291	172	291	528	176	54	166	44	3806

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		79	169	81	117	236	104	76	767	89	41	326	41	2126

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		115	790	146	226	1478	326	348	608	215	177	298	182	4909

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		212	656	221	301	1015	332	194	506	121	138	471	182	4349

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		480	921	208	136	1341	85	393	270	112	40	103	255	4344

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		45	46	40	91	19	181	18	402	64	74	280	19	1279

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		326	876	158	169	1552	64	396	249	153	83	214	217	4457

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		195	739	3	11	911	490	12	43	42	253	12	196	2907

ID	Intersection Name	Northbound		Eastbound	Southwestbound		Total Volume
		Left	Right	Thru	Thru	Right	
35		526	513	1215	1090	942	4286

ID	Intersection Name	Northbound		Southbound			Eastbound		Westbound			Total Volume
		Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		107	147	667	319	700	855	57	255	985	372	4464

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		129	35	29	784	773	34	9	376	469	148	199	94	3079

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		123	1803	1592	0	2270	92	460	52	350	38	2	150	6932

ID	Intersection Name	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
		Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		1058	21	118	944	742	34	109	371	668	251	105	4421

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		795	1260	13	42	667	162	7	26	29	62	55	269	3387

ID	Intersection Name	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		34	26	210	83	481	114	134	1207	55	149	29	26	2548

ID	Intersection Name	Eastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
42		556	336	151	1591	194	34	2862

ID	Intersection Name	Eastbound		Northeastbound		Southwestbound		Total Volume
		Left	Right	Left	Thru	Thru	Right	
51		54	180	223	366	655	233	1711

ID	Intersection Name	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		53	23	119	92	61	80	19	713	105	191	1019	69	2544

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		184	682	4	18	443	417	5	2	2	159	3	61	1980

ID	Intersection Name	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
		2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		39	111	32	10	173	114	14	14	10	342	234	231	1324

ID	Intersection Name	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		20	34	32	434	18	108	11	684	200	68	541	7	2157

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
102		74	844	1350	101	78	95	2542

Vistro File: H:\...\Existing_AM.vistro
Report File: H:\...\Ex_AM_LOS.pdf

Scenario: Base Scenario
8/9/2019

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		Final Base	35	26	307	187	160	3	538	97	88	3	280	133	1857
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**35**	**26**	**307**	**187**	**160**	**3**	**538**	**97**	**88**	**3**	**280**	**133**	**1857**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		Final Base	47	190	109	129	382	282	368	532	64	290	355	91	2839
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**47**	**190**	**109**	**129**	**382**	**282**	**368**	**532**	**64**	**290**	**355**	**91**	**2839**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		Final Base	32	152	128	191	177	4	235	916	247	22	531	56	2691
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**32**	**152**	**128**	**191**	**177**	**4**	**235**	**916**	**247**	**22**	**531**	**56**	**2691**

ID	Intersection Name	Volume Type	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
			Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		Final Base	130	985	261	300	70	702	74	24	70	252	491	105	3464
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**130**	**985**	**261**	**300**	**70**	**702**	**74**	**24**	**70**	**252**	**491**	**105**	**3464**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		Final Base	123	564	197	372	961	66	151	319	102	150	3005
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**123**	**564**	**197**	**372**	**961**	**66**	**151**	**319**	**102**	**150**	**3005**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		Final Base	123	397	82	52	666	280	333	67	184	469	2653
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**123**	**397**	**82**	**52**	**666**	**280**	**333**	**67**	**184**	**469**	**2653**

ID	Intersection Name	Volume Type	Northbound		Southwestbound		Total Volume
			Left	Thru	Thru	Right	
7		Final Base	155	621	451	107	1334
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**155**	**621**	**451**	**107**	**1334**

ID	Intersection Name	Volume Type	Northbound	Southbound	Southeastbound		Total Volume
			Thru	Thru	Left	Right	
8		Final Base	600	448	168	170	1386
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**600**	**448**	**168**	**170**	**1386**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
9		Final Base	584	226	98	891	531	121	2451
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**584**	**226**	**98**	**891**	**531**	**121**	**2451**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		Final Base	120	487	44	124	526	156	251	563	40	18	190	49	2568
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**120**	**487**	**44**	**124**	**526**	**156**	**251**	**563**	**40**	**18**	**190**	**49**	**2568**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
11		Final Base	237	683	1112	302	119	139	2592
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**237**	**683**	**1112**	**302**	**119**	**139**	**2592**

ID	Intersection Name	Volume Type	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		Final Base	440	1551	35	73	609	220	321	180	450	30	596	376	4881
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**440**	**1551**	**35**	**73**	**609**	**220**	**321**	**180**	**450**	**30**	**596**	**376**	**4881**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		Final Base	34	960	111	66	819	495	114	73	3	94	288	62	3119
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**34**	**960**	**111**	**66**	**819**	**495**	**114**	**73**	**3**	**94**	**288**	**62**	**3119**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		Final Base	218	1632	120	63	930	86	668	543	155	138	206	213	4972
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**218**	**1632**	**120**	**63**	**930**	**86**	**668**	**543**	**155**	**138**	**206**	**213**	**4972**

ID	Intersection Name	Volume Type	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		Final Base	459	724	370	179	780	129	210	1105	138	134	481	258	4967
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**459**	**724**	**370**	**179**	**780**	**129**	**210**	**1105**	**138**	**134**	**481**	**258**	**4967**

ID	Intersection Name	Volume Type	Southbound		Northeastbound		Northwestbound		Total Volume
			Thru	Right	Left	Right	Left	Thru	
16		Final Base	629	191	188	216	171	1390	2785
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**629**	**191**	**188**	**216**	**171**	**1390**	**2785**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		Final Base	197	674	173	251	1495	276	287	832	204	194	374	185	5142
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**197**	**674**	**173**	**251**	**1495**	**276**	**287**	**832**	**204**	**194**	**374**	**185**	**5142**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		Final Base	298	1935	51	65	1685	141	273	185	85	32	36	38	4824
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**298**	**1935**	**51**	**65**	**1685**	**141**	**273**	**185**	**85**	**32**	**36**	**38**	**4824**

ID	Intersection Name	Volume Type	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		Final Base	79	974	57	42	1553	67	130	233	51	23	87	91	3387
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**79**	**974**	**57**	**42**	**1553**	**67**	**130**	**233**	**51**	**23**	**87**	**91**	**3387**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		Final Base	37	227	123	92	378	83	126	228	50	29	134	32	1539
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**37**	**227**	**123**	**92**	**378**	**83**	**126**	**228**	**50**	**29**	**134**	**32**	**1539**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		Final Base	154	983	20	2	1698	239	29	21	5	79	3	176	3409
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**154**	**983**	**20**	**2**	**1698**	**239**	**29**	**21**	**5**	**79**	**3**	**176**	**3409**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		Final Base	411	2112	80	56	1913	59	397	432	99	8	49	111	5727
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**411**	**2112**	**80**	**56**	**1913**	**59**	**397**	**432**	**99**	**8**	**49**	**111**	**5727**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		Final Base	220	1257	326	95	795	151	242	535	272	80	166	83	4222
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**220**	**1257**	**326**	**95**	**795**	**151**	**242**	**535**	**272**	**80**	**166**	**83**	**4222**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		Final Base	66	223	128	116	285	210	112	708	73	92	351	117	2481
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**66**	**223**	**128**	**116**	**285**	**210**	**112**	**708**	**73**	**92**	**351**	**117**	**2481**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		Final Base	98	822	256	262	1521	226	400	508	245	130	302	174	4944
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**98**	**822**	**256**	**262**	**1521**	**226**	**400**	**508**	**245**	**130**	**302**	**174**	**4944**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		Final Base	192	624	205	319	1258	320	245	623	110	162	560	190	4808
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**192**	**624**	**205**	**319**	**1258**	**320**	**245**	**623**	**110**	**162**	**560**	**190**	**4808**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		Final Base	61	781	132	110	1291	172	291	528	176	54	166	44	3806
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**61**	**781**	**132**	**110**	**1291**	**172**	**291**	**528**	**176**	**54**	**166**	**44**	**3806**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		Final Base	79	169	81	117	236	104	76	767	89	41	326	41	2126
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**79**	**169**	**81**	**117**	**236**	**104**	**76**	**767**	**89**	**41**	**326**	**41**	**2126**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		Final Base	115	790	146	226	1478	326	348	608	215	177	298	182	4909
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**115**	**790**	**146**	**226**	**1478**	**326**	**348**	**608**	**215**	**177**	**298**	**182**	**4909**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		Final Base	212	656	221	301	1015	332	194	506	121	138	471	182	4349
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**212**	**656**	**221**	**301**	**1015**	**332**	**194**	**506**	**121**	**138**	**471**	**182**	**4349**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		Final Base	480	921	208	136	1341	85	393	270	112	40	103	255	4344
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**480**	**921**	**208**	**136**	**1341**	**85**	**393**	**270**	**112**	**40**	**103**	**255**	**4344**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		Final Base	45	46	40	91	19	181	18	402	64	74	280	19	1279
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**45**	**46**	**40**	**91**	**19**	**181**	**18**	**402**	**64**	**74**	**280**	**19**	**1279**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		Final Base	326	876	158	169	1552	64	396	249	153	83	214	217	4457
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**326**	**876**	**158**	**169**	**1552**	**64**	**396**	**249**	**153**	**83**	**214**	**217**	**4457**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		Final Base	195	739	3	11	911	490	12	43	42	253	12	196	2907
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**195**	**739**	**3**	**11**	**911**	**490**	**12**	**43**	**42**	**253**	**12**	**196**	**2907**

ID	Intersection Name	Volume Type	Northbound		Eastbound	Southwestbound		Total Volume
			Left	Right	Thru	Thru	Right	
35		Final Base	526	513	1215	1090	942	4286
		Growth Factor	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0
		Other	0	0	0	0	0	0
		Future Total	**526**	**513**	**1215**	**1090**	**942**	**4286**

ID	Intersection Name	Volume Type	Northbound		Southbound			Eastbound		Westbound			Total Volume
			Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		Final Base	107	147	667	319	700	855	57	255	985	372	4464
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**107**	**147**	**667**	**319**	**700**	**855**	**57**	**255**	**985**	**372**	**4464**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		Final Base	129	35	29	784	773	34	9	376	469	148	199	94	3079
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**129**	**35**	**29**	**784**	**773**	**34**	**9**	**376**	**469**	**148**	**199**	**94**	**3079**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		Final Base	123	1803	1592	0	2270	92	460	52	350	38	2	150	6932
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**123**	**1803**	**1592**	**0**	**2270**	**92**	**460**	**52**	**350**	**38**	**2**	**150**	**6932**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
			Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		Final Base	1058	21	118	944	742	34	109	371	668	251	105	4421
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1058**	**21**	**118**	**944**	**742**	**34**	**109**	**371**	**668**	**251**	**105**	**4421**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		Final Base	795	1260	13	42	667	162	7	26	29	62	55	269	3387
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**795**	**1260**	**13**	**42**	**667**	**162**	**7**	**26**	**29**	**62**	**55**	**269**	**3387**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		Final Base	34	26	210	83	481	114	134	1207	55	149	29	26	2548
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**34**	**26**	**210**	**83**	**481**	**114**	**134**	**1207**	**55**	**149**	**29**	**26**	**2548**

ID	Intersection Name	Volume Type	Eastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
42		Final Base	556	336	151	1591	194	34	2862
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**556**	**336**	**151**	**1591**	**194**	**34**	**2862**

ID	Intersection Name	Volume Type	Eastbound		Northeastbound		Southwestbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
51		Final Base	54	180	223	366	655	233	1711
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**54**	**180**	**223**	**366**	**655**	**233**	**1711**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		Final Base	53	23	119	92	61	80	19	713	105	191	1019	69	2544
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**53**	**23**	**119**	**92**	**61**	**80**	**19**	**713**	**105**	**191**	**1019**	**69**	**2544**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		Final Base	184	682	4	18	443	417	5	2	2	159	3	61	1980
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**184**	**682**	**4**	**18**	**443**	**417**	**5**	**2**	**2**	**159**	**3**	**61**	**1980**

ID	Intersection Name	Volume Type	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
			2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		Final Base	39	111	32	10	173	114	14	14	10	342	234	231	1324
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**39**	**111**	**32**	**10**	**173**	**114**	**14**	**14**	**10**	**342**	**234**	**231**	**1324**

ID	Intersection Name	Volume Type	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		Final Base	20	34	32	434	18	108	11	684	200	68	541	7	2157
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**20**	**34**	**32**	**434**	**18**	**108**	**11**	**684**	**200**	**68**	**541**	**7**	**2157**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
102		Final Base	74	844	1350	101	78	95	2542
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**74**	**844**	**1350**	**101**	**78**	**95**	**2542**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	0	150	151	0	319	372	961	66	123	564	197
Future Volume (veh/h)	102	0	150	151	0	319	372	961	66	123	564	197
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	119	0	0	176	0	0	433	1117	0	143	656	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	206	0		280	0		578	2350		387	2067	
Arrive On Green	0.12	0.00	0.00	0.08	0.00	0.00	0.17	0.46	0.00	0.11	0.40	0.00
Sat Flow, veh/h	1781	119		3456	176		3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	119	39.3		176	41.2		433	1117	0	143	656	0
Grp Sat Flow(s),veh/h/ln	1781	D		1728	D		1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	5.5			4.3			10.3	13.1	0.0	3.3	7.6	0.0
Cycle Q Clear(g_c), s	5.5			4.3			10.3	13.1	0.0	3.3	7.6	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	206			280			578	2350		387	2067	
V/C Ratio(X)	0.58			0.63			0.75	0.48		0.37	0.32	
Avail Cap(c_a), veh/h	721			1399			4397	5316		2398	2362	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	36.2			38.5			34.3	16.1	0.0	35.6	17.6	0.0
Incr Delay (d2), s/veh	3.1			2.8			2.4	0.3	0.0	0.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5			1.9			4.4	4.9	0.0	1.4	2.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3			41.2			36.6	16.4	0.0	36.2	17.7	0.0
LnGrp LOS	D			D			D	B		D	B	
Approach Vol, veh/h								1550	A		799	A
Approach Delay, s/veh								22.0			21.0	
Approach LOS								C			C	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	18.2	49.8	15.5		23.0	45.0	18.5
Change Period (Y+Rc), s	8.5	10.0	8.5		8.5	10.0	8.5
Max Green Setting (Gmax), s	60.0	90.0	35.0		110.0	40.0	35.0
Max Q Clear Time (g_c+I1), s	5.3	15.1	6.3		12.3	9.6	7.5
Green Ext Time (p_c), s	0.5	20.3	0.8		2.1	8.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	0	469	333	0	67	123	397	82	52	666	280
Future Volume (veh/h)	184	0	469	333	0	67	123	397	82	52	666	280
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	204	0	0	370	0	0	137	441	0	58	740	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	448	0		448	0		165	2954		94	2750	
Arrive On Green	0.13	0.00	0.00	0.13	0.00	0.00	0.19	1.00	0.00	0.05	0.54	0.00
Sat Flow, veh/h	3456	204		3456	370		1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	204	44.8		370	49.6		137	441	0	58	740	0
Grp Sat Flow(s),veh/h/ln	1728	D		1728	D		1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	6.0			11.5			8.1	0.0	0.0	3.5	8.6	0.0
Cycle Q Clear(g_c), s	6.0			11.5			8.1	0.0	0.0	3.5	8.6	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	448			448			165	2954		94	2750	
V/C Ratio(X)	0.46			0.83			0.83	0.15		0.62	0.27	
Avail Cap(c_a), veh/h	754			754			421	2954		308	2750	
HCM Platoon Ratio	1.00			1.00			2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			0.99	0.99	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.3			46.7			44.0	0.0	0.0	51.0	13.7	0.0
Incr Delay (d2), s/veh	0.5			3.0			7.6	0.1	0.0	2.4	0.2	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6			5.1			3.6	0.0	0.0	1.6	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.8			49.6			51.6	0.1	0.0	53.4	13.9	0.0
LnGrp LOS	D			D			D	A		D	B	
Approach Vol, veh/h								578	A		798	A
Approach Delay, s/veh								12.3			16.8	
Approach LOS								B			B	

Timer - Assigned Phs	1	2	3	5	6	7
Phs Duration (G+Y+Rc), s	18.7	68.5	22.7	14.3	72.9	22.7
Change Period (Y+Rc), s	8.5	9.3	8.5	8.5	9.3	8.5
Max Green Setting (Gmax), s	26.0	33.7	24.0	19.0	40.7	24.0
Max Q Clear Time (g_c+I1), s	10.1	10.6	13.5	5.5	2.0	8.0
Green Ext Time (p_c), s	0.2	7.3	0.8	0.0	4.7	0.4

Intersection Summary	
HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	155	621	451	107
Future Volume (veh/h)	0	0	155	621	451	107
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1870	1870	1870	1870
Adj Flow Rate, veh/h			178	714	518	123
Peak Hour Factor			0.87	0.87	0.87	0.87
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			277	3216	2653	1183
Arrive On Green			0.16	1.00	0.75	0.75
Sat Flow, veh/h			3456	3647	3647	1585
Grp Volume(v), veh/h			178	714	518	123
Grp Sat Flow(s),veh/h/ln			1728	1777	1777	1585
Q Serve(g_s), s			2.9	0.0	2.6	1.3
Cycle Q Clear(g_c), s			2.9	0.0	2.6	1.3
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			277	3216	2653	1183
V/C Ratio(X)			0.64	0.22	0.20	0.10
Avail Cap(c_a), veh/h			864	3216	2653	1183
HCM Platoon Ratio			2.00	2.00	1.00	1.00
Upstream Filter(I)			0.96	0.96	0.92	0.92
Uniform Delay (d), s/veh			24.4	0.0	2.3	2.1
Incr Delay (d2), s/veh			0.9	0.2	0.2	0.2
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			1.1	0.1	0.5	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			25.3	0.2	2.4	2.3
LnGrp LOS			C	A	A	A
Approach Vol, veh/h				892	641	
Approach Delay, s/veh				5.2	2.4	
Approach LOS				A	A	

Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		60.0			9.5	50.5
Change Period (Y+Rc), s		5.7			* 4.7	5.7
Max Green Setting (Gmax), s		54.3			* 15	34.6
Max Q Clear Time (g_c+I1), s		2.0			4.9	4.6
Green Ext Time (p_c), s		2.0			0.2	6.7

Intersection Summary	
HCM 6th Ctrl Delay	4.0
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	168	170	0	600	448	0
Future Volume (veh/h)	168	170	0	600	448	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	0
Adj Flow Rate, veh/h	198	200	0	706	527	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	566	259	0	2368	2368	0
Arrive On Green	0.16	0.16	0.00	0.67	1.00	0.00
Sat Flow, veh/h	3456	1585	0	3741	3741	0
Grp Volume(v), veh/h	198	200	0	706	527	0
Grp Sat Flow(s),veh/h/ln	1728	1585	0	1777	1777	0
Q Serve(g_s), s	3.0	7.2	0.0	5.0	0.0	0.0
Cycle Q Clear(g_c), s	3.0	7.2	0.0	5.0	0.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	566	259	0	2368	2368	0
V/C Ratio(X)	0.35	0.77	0.00	0.30	0.22	0.00
Avail Cap(c_a), veh/h	1152	528	0	2368	2368	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.94	0.99	0.00
Uniform Delay (d), s/veh	22.3	24.0	0.0	4.2	0.0	0.0
Incr Delay (d2), s/veh	0.1	1.8	0.0	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.7	0.0	1.3	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.4	25.9	0.0	4.5	0.2	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	398			706	527	
Approach Delay, s/veh	24.1			4.5	0.2	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		45.7		14.3		45.7
Change Period (Y+Rc), s		5.7		4.5		5.7
Max Green Setting (Gmax), s		29.8		20.0		29.8
Max Q Clear Time (g_c+I1), s		7.0		9.2		2.0
Green Ext Time (p_c), s		7.5		0.6		5.8

Intersection Summary	
HCM 6th Ctrl Delay	7.9
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	526	0	513	0	1215	0	0	1090	942
Future Volume (veh/h)	0	0	0	526	0	513	0	1215	0	0	1090	942
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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	0	1870	0	1870	0	0	1870	1870
Adj Flow Rate, veh/h				537	0	523	0	1240	0	0	1112	0
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				2	0	2	0	2	0	0	2	2
Cap, veh/h				881	0	712	0	3411	0	0	1983	
Arrive On Green				0.26	0.00	0.26	0.00	0.53	0.00	0.00	0.53	0.00
Sat Flow, veh/h				3456	0	2790	0	6958	0	0	3741	3170
Grp Volume(v), veh/h				537	0	523	0	1240	0	0	1112	0
Grp Sat Flow(s),veh/h/ln				1728	0	1395	0	1609	0	0	1870	1585
Q Serve(g_s), s				7.3	0.0	9.2	0.0	6.0	0.0	0.0	10.6	0.0
Cycle Q Clear(g_c), s				7.3	0.0	9.2	0.0	6.0	0.0	0.0	10.6	0.0
Prop In Lane				1.00		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				881	0	712	0	3411	0	0	1983	
V/C Ratio(X)				0.61	0.00	0.73	0.00	0.36	0.00	0.00	0.56	
Avail Cap(c_a), veh/h				1291	0	1042	0	11418	0	0	6639	
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				17.6	0.0	18.3	0.0	7.3	0.0	0.0	8.4	0.0
Incr Delay (d2), s/veh				0.5	0.0	1.1	0.0	0.1	0.0	0.0	0.3	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				2.7	0.0	2.7	0.0	1.6	0.0	0.0	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				18.1	0.0	19.4	0.0	7.4	0.0	0.0	8.7	0.0
LnGrp LOS				B	A	B	A	A	A	A	A	
Approach Vol, veh/h					1060			1240			1112	A
Approach Delay, s/veh					18.7			7.4			8.7	
Approach LOS					B			A			A	

Timer - Assigned Phs	2		6		8							
Phs Duration (G+Y+Rc), s	34.3		34.3		19.3							
Change Period (Y+Rc), s	5.9		5.9		5.6							
Max Green Setting (Gmax), s	95.0		95.0		20.0							
Max Q Clear Time (g_c+I1), s	8.0		12.6		11.2							
Green Ext Time (p_c), s	18.1		15.7		2.5							

Intersection Summary	
HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	667	319	700	107	0	147	0	855	57	255	985	372
Future Volume (veh/h)	667	319	700	107	0	147	0	855	57	255	985	372
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	598	455	722	110	0	152	0	881	59	263	1066	0
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	2	2	2	0	2	0	2	2	2	2	2
Cap, veh/h	1728	1814	769	0	0	0	0	1321	88	350	2023	
Arrive On Green	0.48	0.48	0.48	0.00	0.00	0.00	0.00	0.21	0.21	0.10	0.36	0.00
Sat Flow, veh/h	3563	3741	1585		0		0	6471	412	3563	5611	1585
Grp Volume(v), veh/h	598	455	722		0.0		0	683	257	263	1066	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				0	1609	1796	1781	1870	1585
Q Serve(g_s), s	8.8	6.0	36.5				0.0	11.0	11.1	6.1	12.7	0.0
Cycle Q Clear(g_c), s	8.8	6.0	36.5				0.0	11.0	11.1	6.1	12.7	0.0
Prop In Lane	1.00		1.00				0.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	1728	1814	769				0	1026	382	350	2023	
V/C Ratio(X)	0.35	0.25	0.94				0.00	0.67	0.67	0.75	0.53	
Avail Cap(c_a), veh/h	2101	2206	935				0	1423	530	840	3256	
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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	13.5	12.8	20.7				0.0	30.6	30.7	37.2	21.4	0.0
Incr Delay (d2), s/veh	0.0	0.0	14.0				0.0	0.7	2.1	1.2	0.2	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	3.3	2.4	15.2				0.0	4.2	4.9	2.7	5.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	12.8	34.6				0.0	31.4	32.7	38.4	21.6	0.0
LnGrp LOS	B	B	C				A	C	C	D	C	
Approach Vol, veh/h		1775						940			1329	A
Approach Delay, s/veh		21.9						31.7			24.9	
Approach LOS		C						C			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.5	24.3		47.9		36.9
Change Period (Y+Rc), s	* 4.2	6.3		6.8		6.3
Max Green Setting (Gmax), s	* 20	25.0		50.0		49.2
Max Q Clear Time (g_c+I1), s	8.1	13.1		38.5		14.7
Green Ext Time (p_c), s	0.3	4.9		2.6		9.4

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

37: Paseo De La Valencia/I-5 SB Ramps & Avenida De La Carlota

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	199	94	9	376	469	129	35	29	784	773	34
Future Volume (veh/h)	148	199	94	9	376	469	129	35	29	784	773	34
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	156	209	99	9	396	494	136	37	31	825	814	36
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	207	1783	884	15	1601	1136	193	104	102	948	946	42
Arrive On Green	0.06	0.50	0.50	0.01	0.45	0.45	0.06	0.06	0.06	0.27	0.27	0.27
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	3456	1870	1585	3563	3555	157
Grp Volume(v), veh/h	156	209	99	9	396	494	136	37	31	825	428	422
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1728	1870	1585	1781	1870	1842
Q Serve(g_s), s	6.2	4.4	4.1	0.7	9.6	18.0	5.4	2.7	2.6	31.0	30.5	30.5
Cycle Q Clear(g_c), s	6.2	4.4	4.1	0.7	9.6	18.0	5.4	2.7	2.6	31.0	30.5	30.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	207	1783	884	15	1601	1136	193	104	102	948	498	490
V/C Ratio(X)	0.75	0.12	0.11	0.60	0.25	0.43	0.71	0.35	0.30	0.87	0.86	0.86
Avail Cap(c_a), veh/h	442	1783	884	156	1601	1136	750	406	358	1104	580	571
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	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.8	18.5	14.6	69.2	23.8	8.2	65.0	63.7	62.5	49.1	48.9	48.9
Incr Delay (d2), s/veh	2.1	0.1	0.3	9.7	0.3	0.9	1.8	0.8	0.6	6.2	10.0	10.1
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	2.8	1.9	1.8	0.4	4.2	13.5	2.4	1.3	1.1	14.6	15.6	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	18.6	14.9	78.8	24.1	9.0	66.7	64.4	63.1	55.2	58.9	59.0
LnGrp LOS	E	B	B	E	C	A	E	E	E	E	E	E
Approach Vol, veh/h		464			899			204			1675	
Approach Delay, s/veh		34.0			16.4			65.8			57.1	
Approach LOS		C			B			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.9	69.1		13.8	5.7	76.3		44.3
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		7.0
Max Green Setting (Gmax), s	17.9	24.8		30.4	12.3	30.4		43.4
Max Q Clear Time (g_c+I1), s	8.2	20.0		7.4	2.7	6.4		33.0
Green Ext Time (p_c), s	0.2	1.4		0.4	0.0	1.0		4.3

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	2	150	460	52	350	123	1803	1592	0	2270	92
Future Volume (veh/h)	38	2	150	460	52	350	123	1803	1592	0	2270	92
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	40	2	158	621	0	264	129	1898	1676	0	2389	97
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	64	67	192	666	0	296	152	2454	2079	1	4049	164
Arrive On Green	0.04	0.04	0.04	0.19	0.00	0.19	0.09	0.66	0.66	0.00	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	3563	0	1585	1781	3741	3170	1781	7568	307
Grp Volume(v), veh/h	40	2	158	621	0	264	129	1898	1676	0	1913	573
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1585	1781	1870	1585	1781	1515	1815
Q Serve(g_s), s	3.1	0.1	5.0	24.0	0.0	22.7	10.0	49.6	54.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.1	0.1	5.0	24.0	0.0	22.7	10.0	49.6	54.0	0.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	64	67	192	666	0	296	152	2454	2079	1	3242	971
V/C Ratio(X)	0.63	0.03	0.82	0.93	0.00	0.89	0.85	0.77	0.81	0.00	0.59	0.59
Avail Cap(c_a), veh/h	64	67	192	1018	0	453	229	2454	2079	64	3242	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.83	0.83	0.83	0.00	0.81	0.81
Uniform Delay (d), s/veh	66.6	65.2	60.1	56.0	0.0	55.5	63.1	16.8	17.6	0.0	0.0	0.0
Incr Delay (d2), s/veh	14.0	0.1	23.0	8.3	0.0	9.7	9.6	2.0	2.9	0.0	0.6	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	1.7	0.1	6.7	11.6	0.0	9.9	4.9	20.9	19.5	0.0	0.1	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.6	65.2	83.1	64.3	0.0	65.2	72.7	18.9	20.5	0.0	0.6	2.1
LnGrp LOS	F	E	F	E	A	E	E	B	C	A	A	A
Approach Vol, veh/h		200			885			3703			2486	
Approach Delay, s/veh		82.4			64.6			21.5			1.0	
Approach LOS		F			E			C			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	0.0	97.8		10.0	16.9	80.9		32.2				
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		6.0				
Max Green Setting (Gmax), s	5.0	68.0		5.0	18.0	55.0		40.0				
Max Q Clear Time (g_c+I1), s	0.0	56.0		7.0	12.0	2.0		26.0				
Green Ext Time (p_c), s	0.0	4.1		0.0	0.0	5.1		0.1				

Intersection Summary												
HCM 6th Ctrl Delay			21.4									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Lake Forest GPU (Ex. PM)

Vistro File: H:\...\Existing_PM.vistro
Report File: H:\...\Ex_PM_LOS.pdf

Scenario: Base Scenario
8/9/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1		Signalized	ICU 1	NWB Left	0.297	-	A
2		Signalized	ICU 1	NWB Thru	0.505	-	A
3		Signalized	ICU 1	SEB Thru	0.428	-	A
4		Signalized	ICU 1	SEB Left	0.467	-	A
5		Signalized	ICU 1	SB Thru	0.391	-	A
6		Signalized	ICU 1	NEB Thru	0.372	-	A
7		Signalized	ICU 1	NB Thru	0.264	-	A
8		Signalized	ICU 1	NB Thru	0.300	-	A
9		Signalized	ICU 1	NEB Thru	0.593	-	A
10		Signalized	ICU 1	SEB Right	0.589	-	A
11		Signalized	ICU 1	NEB Thru	0.531	-	A
12		Signalized	ICU 1	SB Thru	0.678	-	B
13		Signalized	ICU 1	NEB Thru	0.469	-	A
14		Signalized	ICU 1	NEB Thru	0.679	-	B
15		Signalized	ICU 1	SWB Thru	0.576	-	A
16		Signalized	ICU 1	SB Thru	0.501	-	A
17		Signalized	ICU 1	SEB Thru	0.598	-	A
18		Signalized	ICU 1	SWB Thru	0.569	-	A
19		Signalized	ICU 1	EB Thru	0.529	-	A
20		Signalized	ICU 1	SEB Right	0.274	-	A
21		Signalized	ICU 1	NEB Thru	0.436	-	A
22		Signalized	ICU 1	SWB Thru	0.738	-	C
23		Signalized	ICU 1	NEB Thru	0.717	-	C
24		Signalized	ICU 1	SEB Thru	0.462	-	A
25		Signalized	ICU 1	NEB Thru	0.806	-	D
26		Signalized	ICU 1	NEB Thru	0.662	-	B
27		Signalized	ICU 1	NEB Thru	0.698	-	B
28		Signalized	ICU 1	SEB Thru	0.538	-	A
29		Signalized	ICU 1	NEB Thru	0.703	-	C
30		Signalized	ICU 1	SEB Thru	0.703	-	C
31		Signalized	ICU 1	NEB Thru	0.662	-	B
32		Signalized	ICU 1	SEB Thru	0.451	-	A
33		Signalized	ICU 1	NEB Thru	0.609	-	B
34		Signalized	ICU 1	NB Thru	0.538	-	A
35		Signalized	ICU 1	EB Thru	0.466	-	A

36		Signalized	ICU 1	SB Thru	0.783	-	C
37		Signalized	ICU 1	SWB Thru	0.506	-	A
38		Signalized	ICU 1	NEB Thru	0.661	-	B
39		Signalized	ICU 1	NEB Thru	0.560	-	A
40		Signalized	ICU 1	SWB Thru	0.584	-	A
41		Signalized	ICU 1	NEB Thru	0.400	-	A
42		Signalized	ICU 1	EB Right	0.522	-	A
51		Signalized	ICU 1	NEB Thru	0.576	-	A
56		Signalized	ICU 1	EB Thru	0.591	-	A
57		Signalized	ICU 1	NEB Thru	0.477	-	A
60		Signalized	ICU 1	EB Thru	0.533	-	A
101		Signalized	ICU 1	NEB Thru	0.419	-	A
102		Signalized	ICU 1	NEB Thru	0.447	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.297

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	100.00	150.00	100.00	55.00	315.00	100.00	245.00	170.00	100.00	585.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	107	165	483	111	58	3	307	176	173	1	129	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.87	1.82	2.07	1.80	1.72	0.00	1.95	2.27	1.73	0.00	2.33	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	165	121	111	58	1	307	176	43	1	129	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	41	30	28	15	0	77	44	11	0	32	3
Total Analysis Volume [veh/h]	107	165	121	111	58	1	307	176	43	1	129	13
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Permis	Protect	Permis	Unsign	Protect	Permis	Unsign
Signal Group	7	4	0	3	8	8	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.05	0.00	0.07	0.02	0.00	0.09	0.03	0.00	0.00	0.04	0.00
Intersection LOS	A											
Intersection V/C	0.297											

Intersection Level Of Service Report
Intersection 2:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	190.00	100.00	180.00	285.00	100.00	285.00	230.00	100.00	100.00	230.00	100.00	220.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	187	277	319	186	223	194	247	552	44	288	614	71
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.17	1.88	2.15	1.79	2.06	2.02	1.99	2.27	2.08	1.95	1.41
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	187	277	80	186	223	48	247	552	44	288	614	18
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	47	69	20	47	56	12	62	138	11	72	154	5
Total Analysis Volume [veh/h]	187	277	80	186	223	48	247	552	44	288	614	18
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.08	0.05	0.11	0.07	0.03	0.07	0.18	0.18	0.08	0.12	0.01
Intersection LOS	A											
Intersection V/C	0.505											

Intersection Level Of Service Report
Intersection 3:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.428

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	195.00	100.00	295.00	110.00	100.00	425.00	300.00	100.00	100.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	86	153	188	151	176	29	162	753	172	22	1003	63
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.33	1.96	2.13	1.99	2.27	3.45	1.85	1.99	1.74	0.00	1.99	1.59
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	86	153	47	151	176	7	162	753	172	22	1003	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	38	12	38	44	2	41	188	43	6	251	4
Total Analysis Volume [veh/h]	86	153	47	151	176	7	162	753	172	22	1003	16
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.05	0.03	0.09	0.05	0.00	0.05	0.18	0.18	0.01	0.20	0.01
Intersection LOS	A											
Intersection V/C	0.428											

Intersection Level Of Service Report
Intersection 4:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.467

Intersection Setup

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Approach	Northbound			Westbound			Northeastbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left2	Left	Thru	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	0	0	0	2	0	1
Pocket Length [ft]	200.00	100.00	100.00	215.00	100.00	345.00	100.00	100.00	100.00	515.00	100.00	185.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Base Volume Input [veh/h]	72	586	264	239	37	350	110	39	86	806	1027	96
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.39	2.05	1.89	2.09	2.70	2.00	1.82	2.56	2.33	1.99	2.04	2.08
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	72	586	66	239	37	350	110	39	86	806	1027	24
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	147	17	60	9	88	28	10	22	202	257	6
Total Analysis Volume [veh/h]	72	586	66	239	37	350	110	39	86	806	1027	24
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Protect	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	1	1	6	0	5	2	2	7	4	4
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	Lag	-	Lead	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.11	0.00	0.07	0.01	0.00	0.06	0.04	0.04	0.24	0.20	0.01
Intersection LOS	A											
Intersection V/C	0.467											

Intersection Level Of Service Report
Intersection 5:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.391

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	0	0	2	0	0	1
Pocket Length [ft]	535.00	100.00	300.00	620.00	100.00	70.00	100.00	100.00	555.00	100.00	100.00	730.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	298	1028	114	140	670	187	100	0	146	113	0	324
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.01	2.04	1.75	2.14	1.94	2.14	2.00	0.00	2.05	1.77	0.00	1.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	298	1028	28	140	670	47	100	0	36	113	0	81
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	257	7	35	168	12	25	0	9	28	0	20
Total Analysis Volume [veh/h]	298	1028	28	140	670	47	100	0	36	113	0	81
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	212
Lost time [s]	11.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.20	0.00	0.04	0.13	0.00	0.03	0.00	0.00	0.07	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.391											

Intersection Level Of Service Report
Intersection 6:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.372

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	2	1	0	1
Pocket Length [ft]	170.00	100.00	100.00	370.00	100.00	100.00	100.00	100.00	435.00	550.00	100.00	550.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	249	763	227	79	451	228	46	0	74	236	0	117
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.01	1.97	2.20	2.53	2.00	2.19	2.17	0.00	1.35	2.12	0.00	1.71
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	249	763	57	79	451	57	46	0	18	236	0	29
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	62	191	14	20	113	14	12	0	5	59	0	7
Total Analysis Volume [veh/h]	249	763	57	79	451	57	46	0	18	236	0	29
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.15	0.00	0.05	0.09	0.00	0.01	0.00	0.00	0.07	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.372											

Intersection Level Of Service Report
Intersection 7:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.264

Intersection Setup

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Approach	Northbound		Eastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Left	Right	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	1
Pocket Length [ft]	355.00	100.00	100.00	100.00	100.00	395.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Base Volume Input [veh/h]	151	671	0	0	576	166
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.99	1.94	0.00	0.00	2.08	1.81
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	151	671	0	0	576	41
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	168	0	0	144	10
Total Analysis Volume [veh/h]	151	671	0	0	576	41
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	0	0	6	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.20	0.00	0.00	0.17	0.02
Intersection LOS	A					
Intersection V/C	0.264					

Intersection Level Of Service Report
Intersection 8:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.300

Intersection Setup

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Approach	Northbound		Southbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	655.00	365.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Base Volume Input [veh/h]	0	765	576	0	73	168
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.96	2.08	0.00	1.37	1.79
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	765	576	0	73	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	191	144	0	18	11
Total Analysis Volume [veh/h]	0	765	576	0	73	42
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	0	2	6	0	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.23	0.17	0.00	0.02	0.02
Intersection LOS	A					
Intersection V/C	0.300					

Intersection Level Of Service Report
Intersection 9:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	1
Pocket Length [ft]	100.00	230.00	390.00	100.00	185.00	145.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Base Volume Input [veh/h]	1017	587	270	670	276	209
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.97	2.04	1.85	1.94	2.17	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1017	147	270	670	276	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	254	37	68	168	69	13
Total Analysis Volume [veh/h]	1017	147	270	670	276	52
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.30	0.09	0.16	0.20	0.08	0.02
Intersection LOS	A					
Intersection V/C	0.593					

Intersection Level Of Service Report
Intersection 10:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.589

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	2	0	1	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	340.00	100.00	200.00	250.00	100.00	110.00	245.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Base Volume Input [veh/h]	143	602	49	171	631	319	147	339	74	38	604	137
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.10	1.99	2.04	1.75	2.06	1.88	2.04	2.06	1.35	2.63	1.99	2.19
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	143	602	12	171	631	80	147	339	18	38	604	137
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	151	3	43	158	20	37	85	5	10	151	34
Total Analysis Volume [veh/h]	143	602	12	171	631	80	147	339	18	38	604	137
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.18	0.01	0.10	0.19	0.05	0.04	0.10	0.01	0.02	0.22	0.22
Intersection LOS	A											
Intersection V/C	0.589											

Intersection Level Of Service Report
Intersection 11:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.531

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy. S.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	1	0
Pocket Length [ft]	190.00	100.00	100.00	80.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy. S.	
Base Volume Input [veh/h]	150	1364	851	130	257	176
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.98	2.00	2.31	1.95	2.27
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	1364	851	32	257	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	341	213	8	64	11
Total Analysis Volume [veh/h]	150	1364	851	32	257	44
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Split	Split
Signal Group	5	2	6	6	4	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.40	0.25	0.02	0.08	0.03
Intersection LOS	A					
Intersection V/C	0.531					

Intersection Level Of Service Report
Intersection 12:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.678

Intersection Setup

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	1	0	1	1	0	2
Pocket Length [ft]	400.00	100.00	100.00	200.00	100.00	100.00	395.00	100.00	260.00	150.00	100.00	170.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Base Volume Input [veh/h]	386	827	52	328	1634	434	258	498	572	12	201	161
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.07	2.06	1.92	2.13	2.02	2.07	1.94	2.01	1.92	0.00	1.99	1.86
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	386	827	52	328	1634	108	258	498	143	12	201	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	207	13	82	409	27	65	125	36	3	50	10
Total Analysis Volume [veh/h]	386	827	52	328	1634	108	258	498	143	12	201	40
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	132
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.13	0.13	0.10	0.32	0.06	0.15	0.10	0.08	0.01	0.04	0.02
Intersection LOS	B											
Intersection V/C	0.678											

Intersection Level Of Service Report
Intersection 13:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.469

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Thru	Right	Right2	Left2	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	0
Pocket Length [ft]	285.00	100.00	180.00	285.00	100.00	220.00	345.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Base Volume Input [veh/h]	12	835	149	66	1194	151	435	362	28	96	93	56
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.04	2.01	1.52	2.01	1.99	2.07	1.93	3.57	2.08	2.15	1.79
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	12	835	37	66	1194	38	435	362	28	96	93	56
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	209	9	17	299	10	109	91	7	24	23	14
Total Analysis Volume [veh/h]	12	835	37	66	1194	38	435	362	28	96	93	56
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Permis	Protect	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.25	0.02	0.04	0.35	0.02	0.13	0.23	0.23	0.06	0.03	0.04
Intersection LOS	A											
Intersection V/C	0.469											

Intersection Level Of Service Report
Intersection 14:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.679

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	305.00	100.00	100.00	305.00	100.00	150.00	305.00	100.00	225.00	275.00	100.00	275.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Base Volume Input [veh/h]	190	1265	585	219	1353	127	309	279	100	107	544	264
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.11	1.98	2.05	1.83	2.00	2.36	1.94	2.15	2.00	1.87	2.02	1.89
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	190	1265	585	219	1353	32	309	279	25	107	544	66
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	316	146	55	338	8	77	70	6	27	136	17
Total Analysis Volume [veh/h]	190	1265	585	219	1353	32	309	279	25	107	544	66
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.36	0.36	0.06	0.27	0.02	0.09	0.05	0.01	0.03	0.11	0.04
Intersection LOS	B											
Intersection V/C	0.679											

Intersection Level Of Service Report
Intersection 15:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Approach	Northbound			Northeastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	0	2	0	1
Pocket Length [ft]	210.00	100.00	280.00	275.00	100.00	405.00	160.00	100.00	100.00	175.00	100.00	225.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Base Volume Input [veh/h]	196	474	293	255	1103	445	336	1015	126	340	780	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.04	1.90	2.05	1.96	1.99	2.02	2.08	1.97	2.38	2.06	2.05	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	196	474	73	255	1103	111	336	1015	126	340	780	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	119	18	64	276	28	84	254	32	85	195	11
Total Analysis Volume [veh/h]	196	474	73	255	1103	111	336	1015	126	340	780	42
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	5	2	2	1	6	6	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.09	0.04	0.08	0.22	0.07	0.10	0.22	0.22	0.10	0.15	0.02
Intersection LOS	A											
Intersection V/C	0.576											

Intersection Level Of Service Report
Intersection 16:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.501

Intersection Setup

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Approach	Southbound		Northeastbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	0	0	1	0
Pocket Length [ft]	100.00	200.00	100.00	100.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Base Volume Input [veh/h]	1489	117	148	226	122	762
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.01	1.71	2.03	2.21	1.64	1.97
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1489	29	148	57	122	762
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	372	7	37	14	31	191
Total Analysis Volume [veh/h]	1489	29	148	57	122	762
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Split	Split	Protected	Permissive
Signal Group	4	4	2	2	3	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lag	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.29	0.02	0.09	0.03	0.07	0.15
Intersection LOS	A					
Intersection V/C	0.501					

Intersection Level Of Service Report
Intersection 17:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.598

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	360.00	100.00	305.00	165.00	100.00	175.00	225.00	100.00	230.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Base Volume Input [veh/h]	304	1109	332	245	873	152	128	404	210	381	874	235
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.97	1.98	2.11	2.04	1.95	1.97	2.34	1.98	1.90	2.10	1.95	2.13
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	304	1109	83	245	873	38	128	404	52	381	874	235
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	277	21	61	218	10	32	101	13	95	219	59
Total Analysis Volume [veh/h]	304	1109	83	245	873	38	128	404	52	381	874	235
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3			6,7						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.22	0.01	0.07	0.17	0.00	0.04	0.08	0.03	0.11	0.22	0.22
Intersection LOS	A											
Intersection V/C	0.598											

Intersection Level Of Service Report
Intersection 18:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.569

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	180.00	100.00	205.00	205.00	100.00	225.00	285.00	100.00	100.00	205.00	100.00	110.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	47	1862	315	71	1874	32	51	52	70	121	265	283
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.13	1.99	1.90	1.41	1.97	3.13	1.96	1.92	1.43	1.65	1.89	2.12
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	1862	79	71	1874	8	51	52	70	121	265	71
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	466	20	18	469	2	13	13	18	30	66	18
Total Analysis Volume [veh/h]	47	1862	79	71	1874	8	51	52	70	121	265	71
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.37	0.05	0.04	0.37	0.00	0.03	0.04	0.04	0.04	0.08	0.04
Intersection LOS	A											
Intersection V/C	0.569											

Intersection Level Of Service Report
Intersection 19:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.529

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Approach	Eastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	185.00	180.00	100.00	200.00	155.00	100.00	100.00	135.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	79	1626	136	39	1109	24	52	63	19	108	303	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.53	2.03	2.21	2.56	1.98	0.00	1.92	1.59	0.00	1.85	1.98	1.72
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	79	1626	34	39	1109	6	52	63	19	108	303	58
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	407	9	10	277	2	13	16	5	27	76	15
Total Analysis Volume [veh/h]	79	1626	34	39	1109	6	52	63	19	108	303	58
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.32	0.02	0.02	0.22	0.00	0.03	0.02	0.02	0.06	0.11	0.11
Intersection LOS	A											
Intersection V/C	0.529											

Intersection Level Of Service Report
Intersection 20:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.274

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	110.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	16	247	27	52	178	26	22	85	54	54	318	19
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.02	3.70	1.92	2.25	3.85	0.00	2.35	1.85	1.85	1.89	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	247	27	52	178	26	22	85	54	54	318	19
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	62	7	13	45	7	6	21	14	14	80	5
Total Analysis Volume [veh/h]	16	247	27	52	178	26	22	85	54	54	318	19
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	157
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.08	0.08	0.03	0.06	0.06	0.01	0.04	0.04	0.03	0.10	0.10
Intersection LOS	A											
Intersection V/C	0.274											

Intersection Level Of Service Report
Intersection 21:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.436

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	250.00	100.00	250.00	210.00	100.00	1000.0	100.00	100.00	25.00	170.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	87	1574	18	4	1127	60	7	1	6	210	19	132
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.30	1.97	0.00	0.00	2.04	1.67	0.00	0.00	0.00	1.90	0.00	2.27
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	1574	4	4	1127	15	7	1	1	210	19	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	394	1	1	282	4	2	0	0	53	5	8
Total Analysis Volume [veh/h]	87	1574	4	4	1127	15	7	1	1	210	19	33
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.31	0.00	0.00	0.22	0.01	0.00	0.00	0.00	0.06	0.07	0.02
Intersection LOS	A											
Intersection V/C	0.436											

Intersection Level Of Service Report
Intersection 22:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.738

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	350.00	100.00	190.00	285.00	100.00	200.00	255.00	100.00	100.00	150.00	100.00	80.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	51	2076	503	108	2140	21	154	96	65	68	419	457
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	2.02	1.99	1.85	2.01	0.00	1.95	2.08	1.54	1.47	1.91	1.97
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	51	2076	126	108	2140	5	154	96	65	68	419	114
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	519	32	27	535	1	39	24	16	17	105	29
Total Analysis Volume [veh/h]	51	2076	126	108	2140	5	154	96	65	68	419	114
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.41	0.07	0.06	0.42	0.00	0.09	0.05	0.05	0.02	0.12	0.07
Intersection LOS	C											
Intersection V/C	0.738											

Intersection Level Of Service Report
Intersection 23:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.717

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	195.00	100.00	300.00	255.00	100.00	275.00	240.00	100.00	100.00	190.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	105	1010	119	92	1597	244	81	229	57	262	737	95
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.90	1.98	1.68	2.17	2.00	2.05	2.47	2.18	1.75	1.91	2.04	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	105	1010	30	92	1597	61	81	229	57	262	737	95
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	253	8	23	399	15	20	57	14	66	184	24
Total Analysis Volume [veh/h]	105	1010	30	92	1597	61	81	229	57	262	737	95
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.20	0.02	0.05	0.31	0.04	0.05	0.08	0.08	0.15	0.24	0.24
Intersection LOS	C											
Intersection V/C	0.717											

Intersection Level Of Service Report
Intersection 24:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.462

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	115.00	175.00	100.00	95.00	95.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	33	244	94	51	159	28	74	309	54	55	863	44
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.03	2.05	2.13	1.96	1.89	3.57	1.35	1.94	1.85	1.82	1.97	2.27
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	33	244	23	51	159	7	74	309	54	55	863	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	61	6	13	40	2	19	77	14	14	216	11
Total Analysis Volume [veh/h]	33	244	23	51	159	7	74	309	54	55	863	44
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.07	0.01	0.03	0.05	0.00	0.04	0.11	0.11	0.03	0.27	0.27
Intersection LOS	A											
Intersection V/C	0.462											

Intersection Level Of Service Report
Intersection 25:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.806

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	0
Pocket Length [ft]	195.00	100.00	125.00	360.00	100.00	575.00	155.00	100.00	145.00	180.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	122	1410	339	289	922	70	231	300	248	160	722	89
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.64	1.99	2.06	2.08	1.95	1.43	2.16	2.00	2.02	1.88	1.94	2.25
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	122	1410	85	289	922	17	231	300	62	160	722	89
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	353	21	72	231	4	58	75	16	40	181	22
Total Analysis Volume [veh/h]	122	1410	85	289	922	17	231	300	62	160	722	89
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.28	0.00	0.17	0.18	0.01	0.07	0.09	0.04	0.09	0.24	0.24
Intersection LOS	D											
Intersection V/C	0.806											

Intersection Level Of Service Report
Intersection 26:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	285.00	100.00	100.00	295.00	100.00	110.00	180.00	100.00	175.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	170	1155	260	183	574	144	262	476	176	410	669	196
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	1.99	1.92	2.19	1.92	2.08	1.91	2.10	2.27	1.95	1.94	2.04
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	1155	65	183	574	36	262	476	45	410	669	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	289	16	46	144	9	66	119	11	103	167	12
Total Analysis Volume [veh/h]	170	1155	65	183	574	36	262	476	45	410	669	49
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.23	0.04	0.11	0.11	0.02	0.08	0.14	0.03	0.12	0.20	0.03
Intersection LOS	B											
Intersection V/C	0.662											

Intersection Level Of Service Report
Intersection 27:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	295.00	100.00	285.00	235.00	100.00	290.00	245.00	100.00	210.00	185.00	100.00	255.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	34	1554	334	195	980	45	146	178	131	262	826	104
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.94	1.99	2.10	2.05	2.04	2.22	2.05	2.25	2.29	1.91	2.06	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	34	1554	83	195	980	11	146	178	33	262	826	26
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	389	21	49	245	3	37	45	8	66	207	7
Total Analysis Volume [veh/h]	34	1554	83	195	980	11	146	178	33	262	826	26
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.30	0.05	0.06	0.19	0.01	0.04	0.05	0.02	0.08	0.24	0.01
Intersection LOS	B											
Intersection V/C	0.698											

Intersection Level Of Service Report
Intersection 28:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	185.00	100.00	190.00	175.00	100.00	200.00	180.00	100.00	95.00	300.00	100.00	125.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	111	186	145	134	119	46	56	383	81	47	1093	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.80	2.15	2.07	2.24	1.68	2.17	1.79	2.09	2.47	2.13	2.01	1.37
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	111	186	36	134	119	11	56	383	26	47	1093	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	47	9	34	30	3	14	96	7	12	273	3
Total Analysis Volume [veh/h]	111	186	36	134	119	11	56	383	26	47	1093	12
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.05	0.02	0.08	0.04	0.01	0.03	0.11	0.02	0.03	0.32	0.01
Intersection LOS	A											
Intersection V/C	0.538											

Intersection Level Of Service Report
Intersection 29:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	245.00	100.00	100.00	150.00	100.00	345.00	215.00	100.00	120.00	170.00	100.00	295.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	210	1523	332	157	956	95	291	248	161	245	744	319
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.90	1.97	2.11	1.91	1.99	2.11	2.06	2.02	1.86	2.04	2.02	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	210	1523	91	157	956	24	291	248	40	245	744	80
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	381	23	39	239	6	73	62	10	61	186	20
Total Analysis Volume [veh/h]	210	1523	91	157	956	24	291	248	40	245	744	80
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.30	0.05	0.05	0.19	0.01	0.09	0.07	0.02	0.07	0.22	0.05
Intersection LOS	C											
Intersection V/C	0.703											

Intersection Level Of Service Report
Intersection 30:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	0
Pocket Length [ft]	210.00	100.00	410.00	190.00	100.00	125.00	250.00	100.00	145.00	305.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	151	1111	209	212	630	172	100	360	163	294	646	197
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.99	1.98	1.91	1.89	2.06	1.74	2.00	1.94	1.84	2.04	2.01	2.03
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	151	1111	52	212	630	43	100	360	163	294	646	197
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	278	13	53	158	11	25	90	41	74	162	49
Total Analysis Volume [veh/h]	151	1111	52	212	630	43	100	360	163	294	646	197
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.22	0.03	0.12	0.12	0.03	0.06	0.11	0.10	0.17	0.25	0.25
Intersection LOS	C											
Intersection V/C	0.703											

Intersection Level Of Service Report
Intersection 31:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	1	2	0	1	2	0	2
Pocket Length [ft]	225.00	100.00	290.00	165.00	100.00	180.00	260.00	100.00	155.00	145.00	100.00	250.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	420	1808	526	183	1080	107	302	177	103	177	391	518
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.90	1.99	2.09	2.19	2.04	1.87	1.99	2.26	1.94	2.26	2.05	1.93
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	420	1808	132	183	1080	107	302	177	26	177	391	129
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	105	452	33	46	270	27	76	44	7	44	98	32
Total Analysis Volume [veh/h]	420	1808	132	183	1080	107	302	177	26	177	391	129
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.35	0.08	0.05	0.17	0.17	0.09	0.05	0.02	0.05	0.12	0.00
Intersection LOS	B											
Intersection V/C	0.662											

Intersection Level Of Service Report
Intersection 32:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.451

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	170.00	100.00	100.00	255.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	27	23	18	106	27	86	26	288	110	284	981	52
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.70	0.00	0.00	1.89	3.70	2.33	3.85	2.08	1.82	2.11	2.04	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	23	18	106	27	86	26	288	110	284	981	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	6	5	27	7	22	7	72	28	71	245	13
Total Analysis Volume [veh/h]	27	23	18	106	27	86	26	288	110	284	981	52
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	149
Lost time [s]	7.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	5	5	6	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.02	0.02	0.06	0.06	0.06	0.02	0.12	0.12	0.17	0.30	0.30
Intersection LOS	A											
Intersection V/C	0.451											

Intersection Level Of Service Report
Intersection 33:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.609

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	2	0	1	2	0	1
Pocket Length [ft]	250.00	100.00	235.00	200.00	100.00	100.00	195.00	100.00	200.00	245.00	100.00	155.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	496	1605	229	155	1201	83	276	188	109	257	476	320
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.02	1.99	2.18	1.94	2.00	2.41	2.17	2.13	1.83	1.95	2.10	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	496	1605	57	155	1201	83	276	188	27	257	476	80
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	124	401	14	39	300	21	69	47	7	64	119	20
Total Analysis Volume [veh/h]	496	1605	57	155	1201	83	276	188	27	257	476	80
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Unsign
Signal Group	5	2	2	1	6	6	3	8	8	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.24	0.03	0.05	0.19	0.19	0.08	0.06	0.02	0.08	0.14	0.00
Intersection LOS	B											
Intersection V/C	0.609											

Intersection Level Of Service Report
Intersection 34:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	160.00	100.00	100.00	100.00	100.00	50.00	250.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	164	1099	2	20	652	226	9	21	16	365	29	280
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.83	2.00	0.00	0.00	1.99	2.21	0.00	0.00	0.00	1.92	3.45	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	164	1099	2	20	652	226	9	21	16	365	29	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	41	275	1	5	163	57	2	5	4	91	7	18
Total Analysis Volume [veh/h]	164	1099	2	20	652	226	9	21	16	365	29	70
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.32	0.32	0.01	0.26	0.26	0.01	0.01	0.01	0.11	0.12	0.04
Intersection LOS	A											
Intersection V/C	0.538											

Intersection Level Of Service Report
Intersection 35:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.466

Intersection Setup

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Approach	Northbound			Eastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	640.00	100.00	640.00	190.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Base Volume Input [veh/h]	219	0	585	0	2412	0	0	1148	740	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.83	0.00	2.05	0.00	1.99	0.00	0.00	2.00	2.03	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	219	0	146	0	2412	0	0	1148	185	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	0	37	0	603	0	0	287	46	0	0	0
Total Analysis Volume [veh/h]	219	0	146	0	2412	0	0	1148	185	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	8	0	8	0	2	0	0	6	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.04	0.00	0.35	0.00	0.00	0.23	0.11	0.00	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.466											

Intersection Level Of Service Report
Intersection 36:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.783

Intersection Setup

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	125.00	100.00	100.00	100.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	465.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	118	0	296	1639	602	465	0	1749	100	192	613	520
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.69	0.00	2.03	2.01	1.99	1.94	0.00	2.00	2.00	2.08	1.96	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	118	0	296	1639	602	116	0	1749	100	192	613	130
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	0	74	410	151	29	0	437	25	48	153	33
Total Analysis Volume [veh/h]	118	0	296	1639	602	116	0	1749	100	192	613	130
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Permis	Permis	Permis	Protect	Permis	Permis
Signal Group	8	0	1	4	4	4	0	2	2	1	6	0
Auxiliary Signal Groups			1									
Lead / Lag	Lag	-	-	Lag	-	-	-	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.03	0.32	0.33	0.07	0.00	0.27	0.27	0.06	0.12	0.08
Intersection LOS	C											
Intersection V/C	0.783											

Intersection Level Of Service Report
Intersection 37:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.506

Intersection Setup

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	2	1	0	1	2	0	1
Pocket Length [ft]	145.00	100.00	100.00	100.00	100.00	265.00	35.00	100.00	120.00	135.00	100.00	45.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	126	79	84	787	323	49	20	285	482	253	630	322
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.38	2.53	2.38	2.03	1.86	2.04	0.00	2.11	2.07	1.98	2.06	1.86
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	126	79	21	787	323	49	20	285	120	253	630	322
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	20	5	197	81	12	5	71	30	63	158	81
Total Analysis Volume [veh/h]	126	79	21	787	323	49	20	285	120	253	630	322
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	164
Lost time [s]	8.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Protect	Permis	Protect	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	8	1	6	6
Auxiliary Signal Groups			4,5									
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.05	0.00	0.15	0.22	0.22	0.01	0.08	0.07	0.07	0.19	0.19
Intersection LOS	A											
Intersection V/C	0.506											

Intersection Level Of Service Report
Intersection 38:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	1
Pocket Length [ft]	110.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	410.00	165.00	100.00	165.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Base Volume Input [veh/h]	73	1564	881	0	1715	105	517	53	681	94	3	201
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.37	1.98	2.04	0.00	1.98	1.90	1.93	1.89	2.06	2.13	0.00	1.99
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	1564	220	0	1715	105	517	53	681	94	3	201
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	391	55	0	429	26	129	13	170	24	1	50
Total Analysis Volume [veh/h]	73	1564	220	0	1715	105	517	53	681	94	3	201
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.31	0.13	0.00	0.21	0.21	0.15	0.25	0.25	0.06	0.00	0.08
Intersection LOS	B											
Intersection V/C	0.661											

Intersection Level Of Service Report
Intersection 39:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.560

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	2	0	1	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	305.00	100.00	135.00	215.00	100.00	100.00	215.00	100.00	90.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	0	1740	53	229	931	632	43	99	481	818	521	134
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.01	1.89	2.18	2.04	2.06	2.33	2.02	2.08	1.96	1.92	2.24
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1740	53	229	931	158	43	99	120	818	521	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	435	13	57	233	40	11	25	30	205	130	8
Total Analysis Volume [veh/h]	0	1740	53	229	931	158	43	99	120	818	521	33
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Protect	Permis	Permis	Permis	Permis	Overla	Split	Split	Split
Signal Group	0	2	2	1	6	6	8	8	1	4	4	4
Auxiliary Signal Groups									1,8			
Lead / Lag	-	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.26	0.26	0.07	0.18	0.09	0.03	0.08	0.00	0.16	0.15	0.02
Intersection LOS	A											
Intersection V/C	0.560											

Intersection Level Of Service Report
Intersection 40:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.584

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	0	0	1	1	0	0
Pocket Length [ft]	295.00	100.00	195.00	135.00	100.00	100.00	100.00	100.00	95.00	165.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Base Volume Input [veh/h]	449	778	7	32	1274	101	20	26	33	209	47	1001
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.06	0.00	3.13	1.96	1.98	0.00	3.85	3.03	1.91	2.13	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	449	778	2	32	1274	25	20	26	8	209	47	250
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	112	195	1	8	319	6	5	7	2	52	12	63
Total Analysis Volume [veh/h]	449	778	2	32	1274	25	20	26	8	209	47	250
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	184
Lost time [s]	9.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Protect	Permis	Permis	Permis	Split	Split	Split
Signal Group	5	2	2	1	6	4	8	8	1	4	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.15	0.00	0.01	0.25	0.01	0.01	0.01	0.00	0.06	0.08	0.15
Intersection LOS	A											
Intersection V/C	0.584											

Intersection Level Of Service Report
Intersection 41:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.400

Intersection Setup

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Approach	Southbound			Northeastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	200.00	100.00	205.00	225.00	100.00	230.00	260.00	100.00	155.00	245.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Base Volume Input [veh/h]	21	21	143	146	1098	115	22	493	36	174	40	131
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.10	2.05	2.00	1.74	0.00	2.03	2.78	1.72	2.50	2.29
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	21	36	146	1098	29	22	493	9	174	40	33
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	5	9	37	275	7	6	123	2	44	10	8
Total Analysis Volume [veh/h]	21	21	36	146	1098	29	22	493	9	174	40	33
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	7	4	4	5	2	2	1	6	6	3	8	8
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.02	0.09	0.22	0.02	0.01	0.10	0.01	0.10	0.01	0.02
Intersection LOS	A											
Intersection V/C	0.400											

Intersection Level Of Service Report
Intersection 42:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.522

Intersection Setup

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Approach	Eastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	2	0
Pocket Length [ft]	100.00	100.00	305.00	100.00	260.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Base Volume Input [veh/h]	1330	162	24	762	547	126
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	1.85	0.00	1.97	2.01	2.38
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1330	162	24	762	547	31
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	333	41	6	191	137	8
Total Analysis Volume [veh/h]	1330	162	24	762	547	31
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	8	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.29	0.29	0.01	0.15	0.16	0.02
Intersection LOS	A					
Intersection V/C	0.522					

Intersection Level Of Service Report
Intersection 51:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Approach	Eastbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	255.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Base Volume Input [veh/h]	273	158	143	626	365	73
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.83	1.90	2.10	2.08	1.92	1.37
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	273	39	143	626	365	73
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	10	36	157	91	18
Total Analysis Volume [veh/h]	273	39	143	626	365	73
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	7	5	5	2	6	6
Auxiliary Signal Groups		5				
Lead / Lag	Lag	-	Lead	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.00	0.08	0.37	0.13	0.13
Intersection LOS	A					
Intersection V/C	0.576					

Intersection Level Of Service Report
Intersection 56:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.591

Intersection Setup

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Approach	Northbound			Southbound			Eastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	2	1	0	1	1	0	1
Pocket Length [ft]	170.00	100.00	170.00	100.00	100.00	165.00	290.00	100.00	225.00	295.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Base Volume Input [veh/h]	141	95	180	49	46	26	87	1177	44	180	800	92
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.13	2.11	2.22	2.04	2.17	3.85	2.30	2.04	2.27	2.22	2.00	2.17
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	95	45	49	46	6	87	1177	11	180	800	23
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	24	11	12	12	2	22	294	3	45	200	6
Total Analysis Volume [veh/h]	141	95	45	49	46	6	87	1177	11	180	800	23
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.06	0.03	0.03	0.03	0.00	0.05	0.35	0.01	0.11	0.24	0.01
Intersection LOS	A											
Intersection V/C	0.591											

Intersection Level Of Service Report
Intersection 57:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.477

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	140.00	100.00	175.00	105.00	100.00	200.00	100.00	100.00	35.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Base Volume Input [veh/h]	101	798	20	45	762	188	26	7	14	428	8	147
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.98	2.01	0.00	2.22	1.97	2.13	3.85	0.00	0.00	2.10	0.00	2.04
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	798	5	45	762	47	26	7	14	428	8	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	200	1	11	191	12	7	2	4	107	2	9
Total Analysis Volume [veh/h]	101	798	5	45	762	47	26	7	14	428	8	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.23	0.00	0.03	0.22	0.03	0.02	0.01	0.01	0.13	0.13	0.02
Intersection LOS	A											
Intersection V/C	0.477											

Intersection Level Of Service Report
Intersection 60:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.533

Intersection Setup

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Approach	Southbound			Eastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left2	Left	Right	Left2	Left	Thru	Left	Thru	Right	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	210.00	100.00	100.00	140.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Base Volume Input [veh/h]	28	293	13	47	14	420	254	227	47	147	173	22
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.57	2.05	0.00	2.13	0.00	1.90	1.97	2.20	2.13	2.04	1.73	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	293	13	47	14	420	254	227	47	147	173	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	73	3	12	4	105	64	57	12	37	43	6
Total Analysis Volume [veh/h]	28	293	13	47	14	420	254	227	47	147	173	22
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	129
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis
Signal Group	1	6	6	4	4	4	8	8	8	5	2	2
Auxiliary Signal Groups												
Lead / Lag	Lead	Lag	-	Lag	Lag	-	Lag	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.09	0.09	0.03	0.01	0.25	0.15	0.16	0.16	0.09	0.06	0.06
Intersection LOS	A											
Intersection V/C	0.533											

Intersection Level Of Service Report
Intersection 101:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.419

Intersection Setup

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Approach	Eastbound			Westbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	1
Pocket Length [ft]	65.00	100.00	100.00	60.00	100.00	100.00	150.00	100.00	190.00	155.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	20	7	13	121	16	57	29	829	408	71	821	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	1.65	0.00	1.75	3.45	2.05	1.96	1.41	1.95	3.57
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	7	13	121	16	57	29	829	102	71	821	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	2	3	30	4	14	7	207	26	18	205	2
Total Analysis Volume [veh/h]	20	7	13	121	16	57	29	829	102	71	821	7
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.07	0.04	0.04	0.02	0.24	0.06	0.04	0.24	0.00
Intersection LOS	A											
Intersection V/C	0.419											

Intersection Level Of Service Report
Intersection 102:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.447

Intersection Setup

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Base Volume Input [veh/h]	67	1266	931	43	48	35
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.49	1.97	2.04	2.33	2.08	2.86
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	67	1266	931	43	48	9
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	317	233	11	12	2
Total Analysis Volume [veh/h]	67	1266	931	43	48	9
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Overlap
Signal Group	5	2	6	6	7	5
Auxiliary Signal Groups						5
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.37	0.19	0.19	0.03	0.00
Intersection LOS	A					
Intersection V/C	0.447					

Lake Forest GPU (Ex. PM)

Vistro File: H:\...\Existing_PM.vistro
Report File: H:\...\Ex_PM_LOS.pdf

Scenario: Base Scenario
8/9/2019

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		107	165	483	111	58	3	307	176	173	1	129	52	1765

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		187	277	319	186	223	194	247	552	44	288	614	71	3202

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		86	153	188	151	176	29	162	753	172	22	1003	63	2958

ID	Intersection Name	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
		Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		72	586	264	239	37	350	110	39	86	806	1027	96	3712

ID	Intersection Name	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		298	1028	114	140	670	187	100	146	113	324	3120

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		249	763	227	79	451	228	46	74	236	117	2470

ID	Intersection Name	Northbound		Southwestbound		Total Volume
		Left	Thru	Thru	Right	
7		151	671	576	166	1564

ID	Intersection Name	Northbound	Southbound	Southeastbound		Total Volume
		Thru	Thru	Left	Right	
8		765	576	73	168	1582

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
9		1017	587	270	670	276	209	3029

ID	Intersection Name	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		143	602	49	171	631	319	147	339	74	38	604	137	3254

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
11		150	1364	851	130	257	176	2928

ID	Intersection Name	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		386	827	52	328	1634	434	258	498	572	12	201	161	5363

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		12	835	149	66	1194	151	435	362	28	96	93	56	3477

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		190	1265	585	219	1353	127	309	279	100	107	544	264	5342

ID	Intersection Name	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		196	474	293	255	1103	445	336	1015	126	340	780	170	5533

ID	Intersection Name	Southbound		Northeastbound		Northwestbound		Total Volume
		Thru	Right	Left	Right	Left	Thru	
16		1489	117	148	226	122	762	2864

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		304	1109	332	245	873	152	128	404	210	381	874	235	5247

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		47	1862	315	71	1874	32	51	52	70	121	265	283	5043

ID	Intersection Name	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		79	1626	136	39	1109	24	52	63	19	108	303	58	3616

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		16	247	27	52	178	26	22	85	54	54	318	19	1098

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		87	1574	18	4	1127	60	7	1	6	210	19	132	3245

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		51	2076	503	108	2140	21	154	96	65	68	419	457	6158

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		105	1010	119	92	1597	244	81	229	57	262	737	95	4628

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		33	244	94	51	159	28	74	309	54	55	863	44	2008

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		122	1410	339	289	922	70	231	300	248	160	722	89	4902

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		170	1155	260	183	574	144	262	476	176	410	669	196	4675

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		34	1554	334	195	980	45	146	178	131	262	826	104	4789

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		111	186	145	134	119	46	56	383	81	47	1093	73	2474

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		210	1523	332	157	956	95	291	248	161	245	744	319	5281

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		151	1111	209	212	630	172	100	360	163	294	646	197	4245

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		420	1808	526	183	1080	107	302	177	103	177	391	518	5792

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		27	23	18	106	27	86	26	288	110	284	981	52	2028

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		496	1605	229	155	1201	83	276	188	109	257	476	320	5395

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		164	1099	2	20	652	226	9	21	16	365	29	280	2883

ID	Intersection Name	Northbound		Eastbound	Southwestbound		Total Volume
		Left	Right	Thru	Thru	Right	
35		219	585	2412	1148	740	5104

ID	Intersection Name	Northbound		Southbound			Eastbound		Westbound			Total Volume
		Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		118	296	1639	602	465	1749	100	192	613	520	6294

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		126	79	84	787	323	49	20	285	482	253	630	322	3440

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		73	1564	881	0	1715	105	517	53	681	94	3	201	5887

ID	Intersection Name	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
		Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		1740	53	229	931	632	43	99	481	818	521	134	5681

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		449	778	7	32	1274	101	20	26	33	209	47	1001	3977

ID	Intersection Name	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		21	21	143	146	1098	115	22	493	36	174	40	131	2440

ID	Intersection Name	Eastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
42		1330	162	24	762	547	126	2951

ID	Intersection Name	Eastbound		Northeastbound		Southwestbound		Total Volume
		Left	Right	Left	Thru	Thru	Right	
51		273	158	143	626	365	73	1638

ID	Intersection Name	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		141	95	180	49	46	26	87	1177	44	180	800	92	2917

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		101	798	20	45	762	188	26	7	14	428	8	147	2544

ID	Intersection Name	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
		2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		28	293	13	47	14	420	254	227	47	147	173	22	1685

ID	Intersection Name	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		20	7	13	121	16	57	29	829	408	71	821	28	2420

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
102		67	1266	931	43	48	35	2390

Lake Forest GPU (Ex. PM)

Vistro File: H:\...\Existing_PM.vistro
Report File: H:\...\Ex_PM_LOS.pdf

Scenario: Base Scenario
8/9/2019

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		Final Base	107	165	483	111	58	3	307	176	173	1	129	52	1765
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**107**	**165**	**483**	**111**	**58**	**3**	**307**	**176**	**173**	**1**	**129**	**52**	**1765**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		Final Base	187	277	319	186	223	194	247	552	44	288	614	71	3202
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**187**	**277**	**319**	**186**	**223**	**194**	**247**	**552**	**44**	**288**	**614**	**71**	**3202**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		Final Base	86	153	188	151	176	29	162	753	172	22	1003	63	2958
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**86**	**153**	**188**	**151**	**176**	**29**	**162**	**753**	**172**	**22**	**1003**	**63**	**2958**

ID	Intersection Name	Volume Type	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
			Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		Final Base	72	586	264	239	37	350	110	39	86	806	1027	96	3712
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**72**	**586**	**264**	**239**	**37**	**350**	**110**	**39**	**86**	**806**	**1027**	**96**	**3712**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		Final Base	298	1028	114	140	670	187	100	146	113	324	3120
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**298**	**1028**	**114**	**140**	**670**	**187**	**100**	**146**	**113**	**324**	**3120**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		Final Base	249	763	227	79	451	228	46	74	236	117	2470
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**249**	**763**	**227**	**79**	**451**	**228**	**46**	**74**	**236**	**117**	**2470**

ID	Intersection Name	Volume Type	Northbound		Southwestbound		Total Volume
			Left	Thru	Thru	Right	
7		Final Base	151	671	576	166	1564
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**151**	**671**	**576**	**166**	**1564**

ID	Intersection Name	Volume Type	Northbound	Southbound	Southeastbound		Total Volume
			Thru	Thru	Left	Right	
8		Final Base	765	576	73	168	1582
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**765**	**576**	**73**	**168**	**1582**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
9		Final Base	1017	587	270	670	276	209	3029
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1017**	**587**	**270**	**670**	**276**	**209**	**3029**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		Final Base	143	602	49	171	631	319	147	339	74	38	604	137	3254
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**143**	**602**	**49**	**171**	**631**	**319**	**147**	**339**	**74**	**38**	**604**	**137**	**3254**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
11		Final Base	150	1364	851	130	257	176	2928
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**150**	**1364**	**851**	**130**	**257**	**176**	**2928**

ID	Intersection Name	Volume Type	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		Final Base	386	827	52	328	1634	434	258	498	572	12	201	161	5363
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**386**	**827**	**52**	**328**	**1634**	**434**	**258**	**498**	**572**	**12**	**201**	**161**	**5363**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		Final Base	12	835	149	66	1194	151	435	362	28	96	93	56	3477
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**12**	**835**	**149**	**66**	**1194**	**151**	**435**	**362**	**28**	**96**	**93**	**56**	**3477**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		Final Base	190	1265	585	219	1353	127	309	279	100	107	544	264	5342
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**190**	**1265**	**585**	**219**	**1353**	**127**	**309**	**279**	**100**	**107**	**544**	**264**	**5342**

ID	Intersection Name	Volume Type	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		Final Base	196	474	293	255	1103	445	336	1015	126	340	780	170	5533
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**196**	**474**	**293**	**255**	**1103**	**445**	**336**	**1015**	**126**	**340**	**780**	**170**	**5533**

ID	Intersection Name	Volume Type	Southbound		Northeastbound		Northwestbound		Total Volume
			Thru	Right	Left	Right	Left	Thru	
16		Final Base	1489	117	148	226	122	762	2864
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1489**	**117**	**148**	**226**	**122**	**762**	**2864**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		Final Base	304	1109	332	245	873	152	128	404	210	381	874	235	5247
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**304**	**1109**	**332**	**245**	**873**	**152**	**128**	**404**	**210**	**381**	**874**	**235**	**5247**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		Final Base	47	1862	315	71	1874	32	51	52	70	121	265	283	5043
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**47**	**1862**	**315**	**71**	**1874**	**32**	**51**	**52**	**70**	**121**	**265**	**283**	**5043**

ID	Intersection Name	Volume Type	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		Final Base	79	1626	136	39	1109	24	52	63	19	108	303	58	3616
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**79**	**1626**	**136**	**39**	**1109**	**24**	**52**	**63**	**19**	**108**	**303**	**58**	**3616**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		Final Base	16	247	27	52	178	26	22	85	54	54	318	19	1098
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**16**	**247**	**27**	**52**	**178**	**26**	**22**	**85**	**54**	**54**	**318**	**19**	**1098**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		Final Base	87	1574	18	4	1127	60	7	1	6	210	19	132	3245
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**87**	**1574**	**18**	**4**	**1127**	**60**	**7**	**1**	**6**	**210**	**19**	**132**	**3245**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		Final Base	51	2076	503	108	2140	21	154	96	65	68	419	457	6158
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**51**	**2076**	**503**	**108**	**2140**	**21**	**154**	**96**	**65**	**68**	**419**	**457**	**6158**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		Final Base	105	1010	119	92	1597	244	81	229	57	262	737	95	4628
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**105**	**1010**	**119**	**92**	**1597**	**244**	**81**	**229**	**57**	**262**	**737**	**95**	**4628**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		Final Base	33	244	94	51	159	28	74	309	54	55	863	44	2008
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**33**	**244**	**94**	**51**	**159**	**28**	**74**	**309**	**54**	**55**	**863**	**44**	**2008**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		Final Base	122	1410	339	289	922	70	231	300	248	160	722	89	4902
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**122**	**1410**	**339**	**289**	**922**	**70**	**231**	**300**	**248**	**160**	**722**	**89**	**4902**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		Final Base	170	1155	260	183	574	144	262	476	176	410	669	196	4675
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**170**	**1155**	**260**	**183**	**574**	**144**	**262**	**476**	**176**	**410**	**669**	**196**	**4675**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		Final Base	34	1554	334	195	980	45	146	178	131	262	826	104	4789
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**34**	**1554**	**334**	**195**	**980**	**45**	**146**	**178**	**131**	**262**	**826**	**104**	**4789**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		Final Base	111	186	145	134	119	46	56	383	81	47	1093	73	2474
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**111**	**186**	**145**	**134**	**119**	**46**	**56**	**383**	**81**	**47**	**1093**	**73**	**2474**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		Final Base	210	1523	332	157	956	95	291	248	161	245	744	319	5281
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**210**	**1523**	**332**	**157**	**956**	**95**	**291**	**248**	**161**	**245**	**744**	**319**	**5281**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		Final Base	151	1111	209	212	630	172	100	360	163	294	646	197	4245
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**151**	**1111**	**209**	**212**	**630**	**172**	**100**	**360**	**163**	**294**	**646**	**197**	**4245**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		Final Base	420	1808	526	183	1080	107	302	177	103	177	391	518	5792
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**420**	**1808**	**526**	**183**	**1080**	**107**	**302**	**177**	**103**	**177**	**391**	**518**	**5792**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		Final Base	27	23	18	106	27	86	26	288	110	284	981	52	2028
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**27**	**23**	**18**	**106**	**27**	**86**	**26**	**288**	**110**	**284**	**981**	**52**	**2028**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		Final Base	496	1605	229	155	1201	83	276	188	109	257	476	320	5395
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**496**	**1605**	**229**	**155**	**1201**	**83**	**276**	**188**	**109**	**257**	**476**	**320**	**5395**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		Final Base	164	1099	2	20	652	226	9	21	16	365	29	280	2883
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**164**	**1099**	**2**	**20**	**652**	**226**	**9**	**21**	**16**	**365**	**29**	**280**	**2883**

ID	Intersection Name	Volume Type	Northbound		Eastbound	Southwestbound		Total Volume
			Left	Right	Thru	Thru	Right	
35		Final Base	219	585	2412	1148	740	5104
		Growth Factor	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0
		Other	0	0	0	0	0	0
		Future Total	**219**	**585**	**2412**	**1148**	**740**	**5104**

ID	Intersection Name	Volume Type	Northbound		Southbound			Eastbound		Westbound			Total Volume
			Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		Final Base	118	296	1639	602	465	1749	100	192	613	520	6294
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**118**	**296**	**1639**	**602**	**465**	**1749**	**100**	**192**	**613**	**520**	**6294**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		Final Base	126	79	84	787	323	49	20	285	482	253	630	322	3440
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**126**	**79**	**84**	**787**	**323**	**49**	**20**	**285**	**482**	**253**	**630**	**322**	**3440**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		Final Base	73	1564	881	0	1715	105	517	53	681	94	3	201	5887
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**73**	**1564**	**881**	**0**	**1715**	**105**	**517**	**53**	**681**	**94**	**3**	**201**	**5887**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
			Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		Final Base	1740	53	229	931	632	43	99	481	818	521	134	5681
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1740**	**53**	**229**	**931**	**632**	**43**	**99**	**481**	**818**	**521**	**134**	**5681**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		Final Base	449	778	7	32	1274	101	20	26	33	209	47	1001	3977
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**449**	**778**	**7**	**32**	**1274**	**101**	**20**	**26**	**33**	**209**	**47**	**1001**	**3977**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		Final Base	21	21	143	146	1098	115	22	493	36	174	40	131	2440
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**21**	**21**	**143**	**146**	**1098**	**115**	**22**	**493**	**36**	**174**	**40**	**131**	**2440**

ID	Intersection Name	Volume Type	Eastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
42		Final Base	1330	162	24	762	547	126	2951
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1330**	**162**	**24**	**762**	**547**	**126**	**2951**

ID	Intersection Name	Volume Type	Eastbound		Northeastbound		Southwestbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
51		Final Base	273	158	143	626	365	73	1638
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**273**	**158**	**143**	**626**	**365**	**73**	**1638**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		Final Base	141	95	180	49	46	26	87	1177	44	180	800	92	2917
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**141**	**95**	**180**	**49**	**46**	**26**	**87**	**1177**	**44**	**180**	**800**	**92**	**2917**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		Final Base	101	798	20	45	762	188	26	7	14	428	8	147	2544
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**101**	**798**	**20**	**45**	**762**	**188**	**26**	**7**	**14**	**428**	**8**	**147**	**2544**

ID	Intersection Name	Volume Type	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
			2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		Final Base	28	293	13	47	14	420	254	227	47	147	173	22	1685
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**28**	**293**	**13**	**47**	**14**	**420**	**254**	**227**	**47**	**147**	**173**	**22**	**1685**

ID	Intersection Name	Volume Type	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		Final Base	20	7	13	121	16	57	29	829	408	71	821	28	2420
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**20**	**7**	**13**	**121**	**16**	**57**	**29**	**829**	**408**	**71**	**821**	**28**	**2420**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
102		Final Base	67	1266	931	43	48	35	2390
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**67**	**1266**	**931**	**43**	**48**	**35**	**2390**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	0	324	100	0	146	140	670	187	298	1028	114
Future Volume (veh/h)	113	0	324	100	0	146	140	670	187	298	1028	114
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	119	0	0	105	0	0	147	705	0	314	1082	0
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	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	215	0		292	0		324	2172		434	2334	
Arrive On Green	0.12	0.00	0.00	0.08	0.00	0.00	0.09	0.43	0.00	0.13	0.46	0.00
Sat Flow, veh/h	1781	119		3456	105		3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	119	36.7		105	36.5		147	705	0	314	1082	0
Grp Sat Flow(s),veh/h/ln	1781	D		1728	D		1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	5.2			2.4			3.3	7.6	0.0	7.2	12.0	0.0
Cycle Q Clear(g_c), s	5.2			2.4			3.3	7.6	0.0	7.2	12.0	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215			292			324	2172		434	2334	
V/C Ratio(X)	0.55			0.36			0.45	0.32		0.72	0.46	
Avail Cap(c_a), veh/h	758			1470			4620	5585		2520	2482	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	34.1			35.6			35.3	15.8	0.0	34.6	15.4	0.0
Incr Delay (d2), s/veh	2.7			0.9			1.2	0.1	0.0	2.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4			1.0			1.4	2.8	0.0	3.1	4.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.7			36.5			36.5	15.9	0.0	36.9	15.6	0.0
LnGrp LOS	D			D			D	B		D	B	
Approach Vol, veh/h								852	A		1396	A
Approach Delay, s/veh								19.5			20.4	
Approach LOS								B			C	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	18.8	45.0	15.5		16.2	47.6	18.4
Change Period (Y+Rc), s	8.5	10.0	8.5		8.5	10.0	8.5
Max Green Setting (Gmax), s	60.0	90.0	35.0		110.0	40.0	35.0
Max Q Clear Time (g_c+I1), s	9.2	9.6	4.4		5.3	14.0	7.2
Green Ext Time (p_c), s	1.2	10.4	0.4		0.7	13.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	21.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	236	0	117	46	0	74	249	763	227	79	451	228
Future Volume (veh/h)	236	0	117	46	0	74	249	763	227	79	451	228
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	262	0	0	51	0	0	277	848	0	88	501	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	336	0		336	0		303	3067		112	2519	
Arrive On Green	0.10	0.00	0.00	0.10	0.00	0.00	0.34	1.00	0.00	0.06	0.49	0.00
Sat Flow, veh/h	3456	262		3456	51		1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	262	51.4		51	45.6		277	848	0	88	501	0
Grp Sat Flow(s),veh/h/ln	1728	D		1728	D		1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	8.1			1.5			16.4	0.0	0.0	5.4	6.1	0.0
Cycle Q Clear(g_c), s	8.1			1.5			16.4	0.0	0.0	5.4	6.1	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	336			336			303	3067		112	2519	
V/C Ratio(X)	0.78			0.15			0.91	0.28		0.78	0.20	
Avail Cap(c_a), veh/h	754			754			405	3067		356	2519	
HCM Platoon Ratio	1.00			1.00			2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			0.93	0.93	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	48.5			45.5			35.5	0.0	0.0	50.8	15.7	0.0
Incr Delay (d2), s/veh	2.9			0.2			18.6	0.2	0.0	4.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6			0.6			7.3	0.1	0.0	2.5	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.4			45.6			54.1	0.2	0.0	55.3	15.8	0.0
LnGrp LOS	D			D			D	A		E	B	
Approach Vol, veh/h								1125	A		589	A
Approach Delay, s/veh								13.5			21.7	
Approach LOS								B			C	

Timer - Assigned Phs	1	2	3	5	6	7
Phs Duration (G+Y+Rc), s	27.2	63.6	19.2	15.4	75.4	19.2
Change Period (Y+Rc), s	8.5	9.3	8.5	8.5	9.3	8.5
Max Green Setting (Gmax), s	25.0	34.7	24.0	22.0	37.7	24.0
Max Q Clear Time (g_c+I1), s	18.4	8.1	3.5	7.4	2.0	10.1
Green Ext Time (p_c), s	0.3	5.0	0.1	0.1	10.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	151	671	575	166
Future Volume (veh/h)	0	0	151	671	575	166
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1870	1870	1870	1870
Adj Flow Rate, veh/h			164	729	625	180
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			269	3216	2661	1187
Arrive On Green			0.16	1.00	0.75	0.75
Sat Flow, veh/h			3456	3647	3647	1585
Grp Volume(v), veh/h			164	729	625	180
Grp Sat Flow(s),veh/h/ln			1728	1777	1777	1585
Q Serve(g_s), s			2.7	0.0	3.2	1.9
Cycle Q Clear(g_c), s			2.7	0.0	3.2	1.9
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			269	3216	2661	1187
V/C Ratio(X)			0.61	0.23	0.23	0.15
Avail Cap(c_a), veh/h			864	3216	2661	1187
HCM Platoon Ratio			2.00	2.00	1.00	1.00
Upstream Filter(I)			0.97	0.97	0.96	0.96
Uniform Delay (d), s/veh			24.5	0.0	2.3	2.1
Incr Delay (d2), s/veh			0.8	0.2	0.2	0.3
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			1.0	0.1	0.6	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			25.3	0.2	2.5	2.4
LnGrp LOS			C	A	A	A
Approach Vol, veh/h				893	805	
Approach Delay, s/veh				4.8	2.5	
Approach LOS				A	A	

Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		60.0			9.4	50.6
Change Period (Y+Rc), s		5.7			* 4.7	5.7
Max Green Setting (Gmax), s		54.3			* 15	34.6
Max Q Clear Time (g_c+I1), s		2.0			4.7	5.2
Green Ext Time (p_c), s		2.1			0.2	8.6

Intersection Summary	
HCM 6th Ctrl Delay	3.7
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	168	0	765	575	0
Future Volume (veh/h)	73	168	0	765	575	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	0
Adj Flow Rate, veh/h	76	175	0	797	599	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	495	227	0	2441	2441	0
Arrive On Green	0.14	0.14	0.00	0.69	1.00	0.00
Sat Flow, veh/h	3456	1585	0	3741	3741	0
Grp Volume(v), veh/h	76	175	0	797	599	0
Grp Sat Flow(s),veh/h/ln	1728	1585	0	1777	1777	0
Q Serve(g_s), s	1.2	6.4	0.0	5.4	0.0	0.0
Cycle Q Clear(g_c), s	1.2	6.4	0.0	5.4	0.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	495	227	0	2441	2441	0
V/C Ratio(X)	0.15	0.77	0.00	0.33	0.25	0.00
Avail Cap(c_a), veh/h	1152	528	0	2441	2441	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.82	0.98	0.00
Uniform Delay (d), s/veh	22.5	24.8	0.0	3.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	2.1	0.0	0.3	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	2.4	0.0	1.3	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.6	26.9	0.0	4.1	0.2	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	251			797	599	
Approach Delay, s/veh	25.6			4.1	0.2	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		46.9		13.1		46.9
Change Period (Y+Rc), s		5.7		4.5		5.7
Max Green Setting (Gmax), s		29.8		20.0		29.8
Max Q Clear Time (g_c+I1), s		7.4		8.4		2.0
Green Ext Time (p_c), s		8.5		0.3		6.7

Intersection Summary	
HCM 6th Ctrl Delay	6.0
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	219	0	585	0	2412	0	0	1148	740
Future Volume (veh/h)	0	0	0	219	0	585	0	2412	0	0	1148	740
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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	0	1870	0	1870	0	0	1870	1870
Adj Flow Rate, veh/h				231	0	616	0	2539	0	0	1088	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	0	0	2	2
Cap, veh/h				618	0	499	0	4622	0	0	2687	
Arrive On Green				0.18	0.00	0.18	0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h				3456	0	2790	0	6958	0	0	3741	3170
Grp Volume(v), veh/h				231	0	616	0	2539	0	0	1088	0
Grp Sat Flow(s),veh/h/ln				1728	0	1395	0	1609	0	0	1870	1585
Q Serve(g_s), s				6.6	0.0	20.0	0.0	20.5	0.0	0.0	12.9	0.0
Cycle Q Clear(g_c), s				6.6	0.0	20.0	0.0	20.5	0.0	0.0	12.9	0.0
Prop In Lane				1.00		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				618	0	499	0	4622	0	0	2687	
V/C Ratio(X)				0.37	0.00	1.23	0.00	0.55	0.00	0.00	0.40	
Avail Cap(c_a), veh/h				618	0	499	0	5466	0	0	3178	
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				40.4	0.0	45.9	0.0	7.3	0.0	0.0	6.3	0.0
Incr Delay (d2), s/veh				0.3	0.0	122.0	0.0	0.1	0.0	0.0	0.1	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				2.8	0.0	15.3	0.0	6.2	0.0	0.0	4.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				40.7	0.0	167.9	0.0	7.5	0.0	0.0	6.4	0.0
LnGrp LOS				D	A	F	A	A	A	A	A	
Approach Vol, veh/h					847			2539			1088	A
Approach Delay, s/veh					133.2			7.5			6.4	
Approach LOS					F			A			A	

Timer - Assigned Phs	2				6		8					
Phs Duration (G+Y+Rc), s	86.2				86.2		25.6					
Change Period (Y+Rc), s	5.9				5.9		5.6					
Max Green Setting (Gmax), s	95.0				95.0		20.0					
Max Q Clear Time (g_c+I1), s	22.5				14.9		22.0					
Green Ext Time (p_c), s	57.8				15.1		0.0					

Intersection Summary	
HCM 6th Ctrl Delay	31.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1639	602	465	118	0	296	0	1749	100	192	613	520
Future Volume (veh/h)	1639	602	465	118	0	296	0	1749	100	192	613	520
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1738	584	484	123	0	308	0	1822	104	200	639	0
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	2	2	2	0	2	0	2	2	2	2	2
Cap, veh/h	2069	724	614	0	0	0	0	1969	112	290	1676	
Arrive On Green	0.39	0.39	0.39	0.00	0.00	0.00	0.00	0.31	0.31	0.08	0.45	0.00
Sat Flow, veh/h	5344	1870	1585		0		0	6535	358	3563	3741	3170
Grp Volume(v), veh/h	1738	584	484		0.0		0	1402	524	200	639	0
Grp Sat Flow(s),veh/h/ln	1781	1870	1585				0	1609	1806	1781	1870	1585
Q Serve(g_s), s	23.5	22.1	21.4				0.0	22.3	22.3	4.3	9.0	0.0
Cycle Q Clear(g_c), s	23.5	22.1	21.4				0.0	22.3	22.3	4.3	9.0	0.0
Prop In Lane	1.00		1.00				0.00		0.20	1.00		1.00
Lane Grp Cap(c), veh/h	2069	724	614				0	1514	567	290	1676	
V/C Ratio(X)	0.84	0.81	0.79				0.00	0.93	0.93	0.69	0.38	
Avail Cap(c_a), veh/h	3362	1177	997				0	1518	568	897	2316	
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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.1	21.7	21.5				0.0	26.4	26.4	35.5	14.6	0.0
Incr Delay (d2), s/veh	0.5	0.8	0.9				0.0	10.0	21.3	1.1	0.1	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	9.2	9.2	7.6				0.0	9.5	12.4	1.9	3.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	22.5	22.3				0.0	36.4	47.6	36.6	14.7	0.0
LnGrp LOS	C	C	C				A	D	D	D	B	
Approach Vol, veh/h		2806						1926			839	A
Approach Delay, s/veh		22.5						39.4			20.0	
Approach LOS		C						D			B	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	10.7	31.2		37.6		41.9
Change Period (Y+Rc), s	* 4.2	6.3		6.8		6.3
Max Green Setting (Gmax), s	* 20	25.0		50.0		49.2
Max Q Clear Time (g_c+I1), s	6.3	24.3		25.5		11.0
Green Ext Time (p_c), s	0.2	0.6		5.3		5.0

Intersection Summary	
HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	253	630	322	20	285	482	126	79	84	787	323	49
Future Volume (veh/h)	253	630	322	20	285	482	126	79	84	787	323	49
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	264	656	335	21	297	502	131	82	88	712	488	51
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	314	1902	958	28	1634	1083	239	130	134	796	744	77
Arrive On Green	0.09	0.54	0.54	0.02	0.46	0.46	0.07	0.07	0.07	0.22	0.22	0.22
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	3456	1870	1585	3563	3331	347
Grp Volume(v), veh/h	264	656	335	21	297	502	131	82	88	712	273	266
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1728	1870	1585	1781	1870	1808
Q Serve(g_s), s	11.3	15.8	15.9	1.8	7.4	22.0	5.5	6.4	8.1	29.1	19.9	20.1
Cycle Q Clear(g_c), s	11.3	15.8	15.9	1.8	7.4	22.0	5.5	6.4	8.1	29.1	19.9	20.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	314	1902	958	28	1634	1083	239	130	134	796	418	404
V/C Ratio(X)	0.84	0.34	0.35	0.76	0.18	0.46	0.55	0.63	0.65	0.89	0.65	0.66
Avail Cap(c_a), veh/h	518	1902	958	143	1634	1083	346	187	183	903	474	458
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	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.1	19.9	14.9	73.6	23.9	11.0	67.5	67.9	66.5	56.5	53.0	53.0
Incr Delay (d2), s/veh	2.8	0.5	1.0	11.3	0.2	1.1	0.7	1.9	2.0	9.8	1.8	1.9
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	5.1	6.8	7.3	0.9	3.2	14.7	2.5	3.1	3.4	14.2	9.6	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	20.4	15.9	84.8	24.1	12.1	68.3	69.8	68.5	66.3	54.8	55.0
LnGrp LOS	E	C	B	F	C	B	E	E	E	E	D	D
Approach Vol, veh/h		1255			820			301			1251	
Approach Delay, s/veh		29.6			18.3			68.8			61.4	
Approach LOS		C			B			E			E	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.1	75.0		16.4	6.8	86.3		40.5
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		7.0
Max Green Setting (Gmax), s	22.5	51.0		15.0	12.0	61.5		38.0
Max Q Clear Time (g_c+I1), s	13.3	24.0		10.1	3.8	17.9		31.1
Green Ext Time (p_c), s	0.3	2.3		0.3	0.0	3.9		2.4

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	3	201	517	53	681	73	1564	881	0	1715	105
Future Volume (veh/h)	94	3	201	517	53	681	73	1564	881	0	1715	105
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	97	3	207	800	0	458	75	2029	630	0	1768	108
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	224	274	1066	0	474	94	2622	741	1	2822	172
Arrive On Green	0.12	0.12	0.12	0.30	0.00	0.30	0.05	0.47	0.47	0.00	0.51	0.51
Sat Flow, veh/h	1781	1870	1585	3563	0	1585	1781	5611	1585	1781	7398	451
Grp Volume(v), veh/h	97	3	207	800	0	458	75	2029	630	0	1448	428
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1585	1781	1870	1585	1781	1515	1789
Q Serve(g_s), s	7.6	0.2	18.0	30.4	0.0	42.7	6.2	45.3	52.7	0.0	25.9	26.0
Cycle Q Clear(g_c), s	7.6	0.2	18.0	30.4	0.0	42.7	6.2	45.3	52.7	0.0	25.9	26.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	214	224	274	1066	0	474	94	2622	741	1	2311	682
V/C Ratio(X)	0.45	0.01	0.76	0.75	0.00	0.97	0.80	0.77	0.85	0.00	0.63	0.63
Avail Cap(c_a), veh/h	214	224	274	1259	0	560	214	2622	741	214	2311	682
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.53	0.53	0.53	0.00	0.86	0.86
Uniform Delay (d), s/veh	61.4	58.2	59.1	47.5	0.0	51.8	70.3	33.3	35.3	0.0	29.2	29.3
Incr Delay (d2), s/veh	0.6	0.0	10.3	1.6	0.0	26.2	3.1	1.2	6.7	0.0	1.1	3.7
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	3.5	0.1	8.3	13.8	0.0	20.4	2.9	20.7	21.5	0.0	9.0	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.0	58.2	69.4	49.1	0.0	78.0	73.4	34.6	42.0	0.0	30.4	33.0
LnGrp LOS	E	E	E	D	A	E	E	C	D	A	C	C
Approach Vol, veh/h		307			1258			2734			1876	
Approach Delay, s/veh		66.9			59.6			37.3			31.0	
Approach LOS		E			E			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	76.1		23.0	12.9	63.2		50.9
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		6.0
Max Green Setting (Gmax), s	18.0	39.0		18.0	18.0	39.0		53.0
Max Q Clear Time (g_c+I1), s	0.0	54.7		20.0	8.2	28.0		44.7
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	2.9		0.2

Intersection Summary	
HCM 6th Ctrl Delay	41.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Appendix 3: Assumed Future Roadway Improvements

20 YEAR IMPROVEMENTS (Current LFTAM)		
Roadway	**Segment**	**Description**
El Toro Road	Live Oak Canyon Road to Glenn Ranch Road	Existing roadway is two lanes (one lane in each direction) and on the MPAH it is improved to six lanes (three lanes in each direction)
El Toro Road	Glenn Ranch Road to Marguerite Parkway	Existing roadway is five lanes (two southbound and three northbound) and on the MPAH it is improved to six lanes (three lanes in each direction)
El Toro Road	Montcliff Drive to Raintree Lane	Existing roadway is 5 lanes (3 southbound, 2 northbound) and the MPAH it is improved to 6 lanes (three lanes in each direction).
Portola Parkway	Market to Lake Forest Drive segment	Existing roadway is 5 lanes (3 eastbound, 2 westbound) and on the MPAH it is improved to six lanes (3 lanes in each direction)

Table 3-3 Summary of Deficient Intersections and Proposed Improvements

Intersection (NS & EW)	ICU Without Improvements		ICU With Improvements		Improvements	Funding Source(s)
	AM	PM	AM	PM		
Deficient Locations under Baseline (Committed) Network						
10. Lake Forest & Rancho	Improvements Completed		0.77	0.90	Restripe westbound approach to add 2nd westbound left-turn lane (Completed) and convert dedicated westbound right-turn lane to a defacto right-turn lane. Add a 2nd eastbound through lane (Completed).	LFTM Program
12. El Toro & Portola/Santa Margarita	0.87	1.09	0.67	0.87	Add a 2nd northbound left-turn lane. Add a 2nd southbound right-turn lane.	LFTM Program
14. Bake & Irvine/Trabuco	1.12	0.87	0.85	0.80	Add a 2nd northbound left-turn lane. Convert the 3rd eastbound through lane to a shared through/right-turn lane. Convert the westbound right-turn lane to a 4th through lane.	NITM Program
					Provide a defacto westbound right-turn lane.	LFTM Program
22. Bake & Jeronimo	1.02	0.87	0.90	0.87	Add a 2nd northbound left-turn lane.	NITM Program & LFTM
23. Lake Forest & Jeronimo[5]	0.75	0.85	0.75	0.83	Provide a defacto eastbound right-turn lane.	NITM and LFTM Programs
31. Lake Forest & Rockfield[5]	0.78	0.83	0.81	0.79	Convert the 2nd westbound through lane to a shared left-turn/through lane. Convert traffic signal phasing for eastbound and westbound approaches to split phase operation.	NITM and LFTM Programs
34. Los Alisos & Rockfield[5]	0.87	0.83	0.70	0.77	Add a southbound right-turn lane.	NITM and LFTM Programs
36. Lake Forest & I-5/Carlota	0.66	0.94	0.55	0.78	Convert the shared eastbound left- turn/through lane to a 3rd left-turn lane. Add a 2nd westbound left-turn lane. Add right-turn overlap phasing for westbound right-turn lane.	NITM Program
					Add a 2nd eastbound through lane.	LFTM Program

(Continued)

Table 3-3 Summary of Deficient Intersections and Proposed Improvements (Continued)

Intersection (NS & EW)	ICU Without Improvements		ICU With Improvements		Improvements	Funding Source(s)
	AM	PM	AM	PM		
Deficient Locations under MPAH Network						
2. Bake & Portola [1,3]	Improvements Completed		0.66 / 0.62	0.94 / 0.95	Add a 3rd westbound through lane or add a 2nd eastbound left-turn lane (Completed).	LFTM Program
32. Ridge Route & Rockfield[1,3]	0.85	1.25	0.80	1.12	Add a defacto northbound right-turn lane.	NITM and LFTM Programs
105. Alton & Irvine[2,3,4]	0.90	1.01	0.76	0.93	Reconfigure the eastbound approach to add a 3rd eastbound left-turn lane, remove dedicated eastbound right-turn lane, and provide a defacto eastbound right-turn lane.	LFTM Program
117. Alton & Toledo[2,3]	Improvements Completed		0.67	0.87	Add right-turn overlap signal phasing for westbound right-turn lanes.	LFTM Program
125. Bake & Rockfield[2,3,4]	0.69	0.92	0.68	0.89	Reconfigure the westbound approach to add a 3rd westbound left-turn lane, remove dedicated westbound free-flow right-turn lane and provide a defacto westbound right-turn lane.	LFTM Program

Notes:

[1] Although this location is not forecast to operate deficiently under the committed network scenario, it has been identified as not meeting the performance criteria in the traffic impact analysis for the OSA Alternative 7/Hybrid Alternative project and therefore is impacted by the OSA project and the improvements are included in the LFTM Program (all ICUs presented for this location are taken from the May 2008 Alternative 7/Hybrid Alternative traffic impact analysis).

[2] This is a city of Irvine location identified in the Vacant Land Opportunities traffic impact analysis as being impacted by the OSA Alternative 7/Hybrid Alternative project, and the improvements included in the LFTM Program at this location are included to address the impact of the OSA project. To show that the improvements mitigate project impacts, the ICUs for Current General Plan conditions are also presented in parentheses (all ICUs presented for this location are taken from the May 2008 Alternative 7/Hybrid Alternative traffic impact analysis).

[3] These locations are impacted under conditions assuming the completion of the roadway system according to the County of Orange MPAH. The improvements for these locations would be implemented as presented here should the Portola gap connection and Ridge Route Drive/I-5 Freeway Overcrossing be constructed.

[4] In comparison to the City's original General Plan improvements, this improvement represents a restriping of the approach.

[5] This location was forecasted to have an ICU/LOS deficiency in earlier LFTM updates. Due to recent intersection improvements and/or refinements to the LFTAM land use, this location is not forecast to have a deficient ICU/LOS under the baseline scenario analyzed in this report. Based on discussions with City staff, the intersection remains part of the LFTM program due to either being on the LOS D/LOS E cusp or intersection sensitivity, and therefore improvements are maintained as part of the LFTM program.

Abbreviations:

ICU – Intersection Capacity Utilization, LFTM – Lake Forest Transportation Mitigation Program, NITM – North Irvine Transportation Mitigation Program

See Table 1-7 for a listing of committed improvements not a part of the LFTM Program.

CITY OF LAKE FOREST

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Proposed
Capital Improvement Projects Budget

2019-2021

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CAPITAL IMPROVEMENT PROJECTS BUDGET
FISCAL YEARS 2019-21

Elected Officials

Mark Tettemer, Mayor
Neeki Moatazedi, Mayor Pro Tem
Leah Basile, Council Member
Dwight Robinson, Council Member
Scott Voigts, Council Member

Planning Commission	Community Services Commission	Traffic and Parking Commission
Thomas Ludden, Chair	Jim Rosenberg, Chair	Jim Richert, Chair
David Carter, Vice Chair	Loretta Herrin, Vice Chair	Jordan Villwock. Vice Chair
Mark Armando, Commissioner	Margie Matsil, Commissioner	Benjamin Yu, Commissioner
Francisco Barajas, Commissioner	Lisa Porter, Commissioner	Mike James, Commissioner
Jolene Fuentes, Commissioner	Victor Scherr, Commissioner	Robert Pequeno, Commissioner

City Staff

Debra Rose, City Manager
Keith D. Neves, Assistant City Manager

Gayle Ackerman, Director of Community Development
Mike Contreras, Division Chief - Fire Services
Brett Channing, Director of Management Services
Maria D. Huizar, City Clerk
Matthew Richardson, City Attorney
Kevin R. Shirah, Director of Finance/City Treasurer
Lieutenant Chad Taylor, Chief of Police Services
Scott Wasserman, Director of Community Services
Tom Wheeler, Director of Public Works/City Engineer

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CAPITAL IMPROVEMENT PROJECTS BUDGET

TABLE OF CONTENTS

	Page
City Manager's Budget Message	1
Two-Year Capital Project Plan - Expenditures	2
Two-Year Capital Project Plan - Funding Sources	3
Detail Descriptions of Projects	4

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Mayor
Mark Tettemer

Mayor Pro Tem
Neeki Moatazedi

Council Members
Leah Basile
Dwight Robinson
Scott Voigts

City Manager
Debra DeBruhl Rose

May 14, 2019

Honorable Mayor and Members of the City Council:

Submitted for your review is the Capital Improvement Projects Budget ("CIP Budget") for Fiscal Years FY 2019-20 and 2020-21. The CIP Budget complements the City's Annual Operating Budget and the Five-Year Strategic Business Plan. The annual Operating and CIP Budgets include funding for capital projects. Future operating costs related to each project, if any, are documented in the Five Year Strategic Business Plan.

The CIP Budget includes projects that reflect the City's commitment to providing highly desired facilities, while maintaining and improving existing infrastructure and assets. The CIP Budget continues with the fifteen traffic and street related projects. These projects are designed to improve safety, traffic flow, median and parkway landscaping, and maintain the roadway network. Other projects include school crosswalk safety enhancements, signal synchronization projects with neighboring cities, traffic modeling to support the General Plan update, street asphalt resurfacing, and sidewalk rehabilitation. Also included in the CIP are numerous playground repairs and enhancements, including the addition of shade structures to existing park playgrounds.

The CIP Budget summarizes funding for each project beginning on page 4. The largest funding source for the CIP Budget is the Neighborhood Park Improvement Reserve Fund. Monies contained in the Lake Forest Transportation Mitigation Fund (LFTM) and Foothill Circulation Phasing Plan Fund were provided by developers as part of the public benefit component of the Opportunity Study Area development agreements. Other sources of funding include the CIP Fund, Infrastructure Reserve, Gas Tax, Road Maintenance and Rehab Account, Air Quality Improvement District, and Orange County Transportation Authority (OCTA) Measure M2 Fund. Grant revenues also will provide additional funding.

The CIP Budget represents a new investment of approximately $25.3 million over the next two years. Due to strategic and conservative funding of capital improvements projects, the City of Lake Forest continues to maintain and improve its infrastructure, adding to the high quality of life enjoyed by our residents and businesses.

Sincerely,

Debra Rose
City Manager

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25550 Commercentre Dr., Suite 100
Lake Forest, CA 92630
(949) 461-3400
City Hall Fax: (949) 461-3511

Two-Year Capital Project Plan - Expenditures

Project Class and Number	Public Works Project #	Category	Description	Fiscal Year of Funding FY 2019-20	Fiscal Year of Funding FY 2020-21
S1		Streets	Annual Street Sidewalk Rehabilitation Program	$ 75,000	$ 75,000
S2		Streets	CDBG - ADA Ramps Phase 13	-	125,000
S3		Streets	Annual Pavement Management Program - Street Resurfacing and Slurry Seal	4,644,000	4,644,000
T1		Traffic	Bake / Trabuco / Irvine Intersection Improvements	1,138,000	-
T2		Traffic	Second Eastbound Left Turn Lane and 2nd Westbound Right Turn Lane on El Toro at Portola/Santa Margarita	659,000	1,623,200
T3		Traffic	Widening of Southbound Jeronimo at Lake Forest Drive	-	35,500
T4		Traffic	Dedicated Right Turn Lane on EB Ridge Route Drive at Rockfield Blvd	2,300	-
T5		Traffic	Lake Forest & Rockfield Restriping / Split Phase Signaling	11,000	56,200
T6		Traffic	Second Eastbound Left Turn Lane on Bake Parkway at Jeronimo	-	235,000
T7		Traffic	Southbound Rancho Parkway Widening at Lake Forest Drive for Dedicated Right Turn Lane	-	60,000
T8		Traffic	Second Left Turn Lanes in All Directions at the Intersection of Los Alisos and Muirlands	450,000	1,450,000
T9		Traffic	Widening/Realignment of Jeronimo at El Toro Road	100,000	700,000
T10		Traffic	El Toro Raised Medians from Jeronimo to Trabuco	-	100,000
T11		Traffic	Protective Permissive Left Turn Phasing Program	200,000	100,000
T12		Traffic	Los Alisos Traffic Signal Synchronization Program	18,000	-
P1		Parks & Recreation	CDBG - El Toro Park Improvements	132,500	-
P2		Parks & Recreation	Sports Court Resurfacing Project	-	32,500
P3		Parks & Recreation	Playground Resurfacing Project	225,000	-
P4		Parks & Recreation	Park Sidewalk Rehabilitation Project	50,000	50,000
P5		Parks & Recreation	Park Amenities Replacements	40,000	40,000
P6		Parks & Recreation	Neighborhood Park Renovations	3,150,000	3,500,000
P7		Parks & Recreation	Park Light Pole Replacements	325,000	-
P8		Parks & Recreation	Arbor Mini Park (Garden Park)	20,000	10,000
P9		Parks & Recreation	The Arbor Parkway Repairs	95,000	-
P10		Parks & Recreation	Urban Forestry Management	205,000	-
P11		Parks & Recreation	Heroes Park Irrigation Improvements	110,000	-
P12		Parks & Recreation	Heroes Park & Etnies Park Musco LED Light Replacements	-	30,000
P13		Parks & Recreation	Park Name Sign Medallion Replacements	25,000	-
P14		Parks & Recreation	Park Restroom Timers Installation	25,000	-
P15		Parks & Recreation	Sports Complex Paver Replacement Project	-	50,000
P16		Parks & Recreation	Recreation Center Sliding Doors Installation	40,000	-
P17		Parks & Recreation	Sports Park Complex Painting	36,000	-
P18		Parks & Recreation	Calsense Controllers	45,000	-
P19		Parks & Recreation	Park Parking Lot Resurfacing	-	120,000
P20		Parks & Recreation	Heroes Park Security Improvements	70,000	-
P21		Parks & Recreation	El Toro Park Security Improvements	-	70,000
E1		Environmental	Catch Basin Best Management Practices Environmental Tier 1 Improvements	133,500	133,500
E2		Environmental	Packer Place Storm Drain Improvements	7,500	67,500
			TOTAL	$ 12,031,800	$ 13,307,400

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Two-Year Capital Project Plan - Funding Sources

	Fiscal Year of Funding	
	FY 2019-20	FY 2020-21
Funding Needs:		
Capital Project Expenditures	$ 12,031,800	$ 13,307,400
Funding Sources:		
General Fund Capital Improvement Project Fund	$ 1,344,375	$ 435,875
Infrastructure Reserve Fund	1,799,156	1,763,135
Neighborhood Park Improvement Reserve Fund	3,150,000	3,500,000
Gas Tax Fund (HUTA)	282,500	242,500
Gas Tax Fund Road Maintenance and Rehab Account	1,404,000	1,404,000
Measure M2 Local Fair Share	1,440,844	1,476,865
Air Quality Improvement District Fund	18,000	-
Community Development Block Grant Fund	132,500	125,000
Lake Forest Traffic Mitigation Fund	1,810,300	2,009,900
Foothill Circulation Phasing Plan Capital Projects Fund	550,000	2,250,000
M2 CTFP Competitive Grant Funds	100,125	100,125
TOTAL	$ 12,031,800	$ 13,307,400

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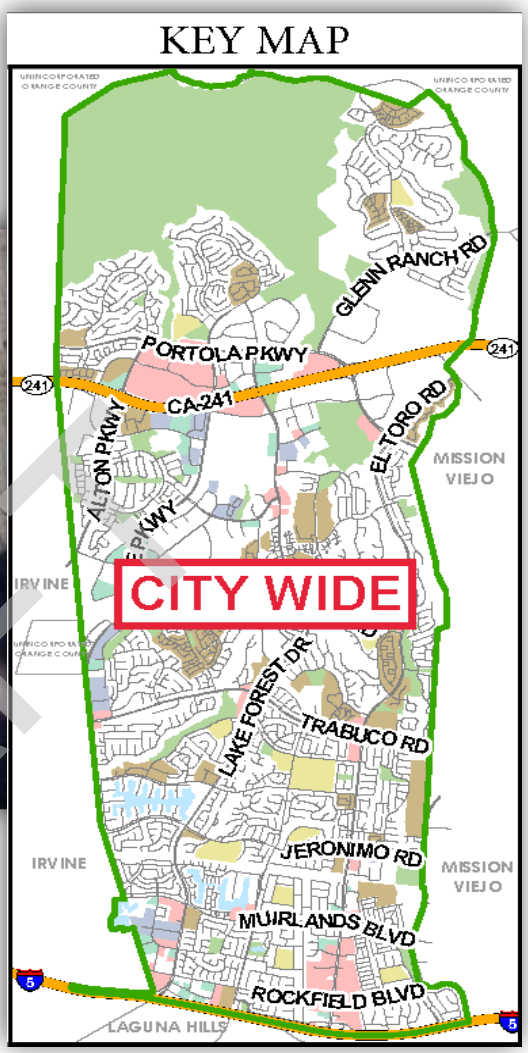
PROJECT NUMBER/NAME: PW# / Annual Street Sidewalk Rehabilitation Program
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Streets



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PROJECT DESCRIPTION:
This project would remove and replace damaged sidewalk panels and other displacements within the pedestrian path of travel citywide along both residential and arterial streets.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively ehannce the visual character of the City and plan for maintenance of all City assets.

Regular sidewalk repair provides a high-quality pedestrian ciruclation system. Smooth, unbroken surfaces are safer for pedestrians.

PROJECT NUMBER/NAME: PW# / Annual Street Sidewalk Rehabilitation Program
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Streets

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance, which would help control or reduce sidewalk, risk management, and operating costs.

NO PRIOR YEAR FUNDING

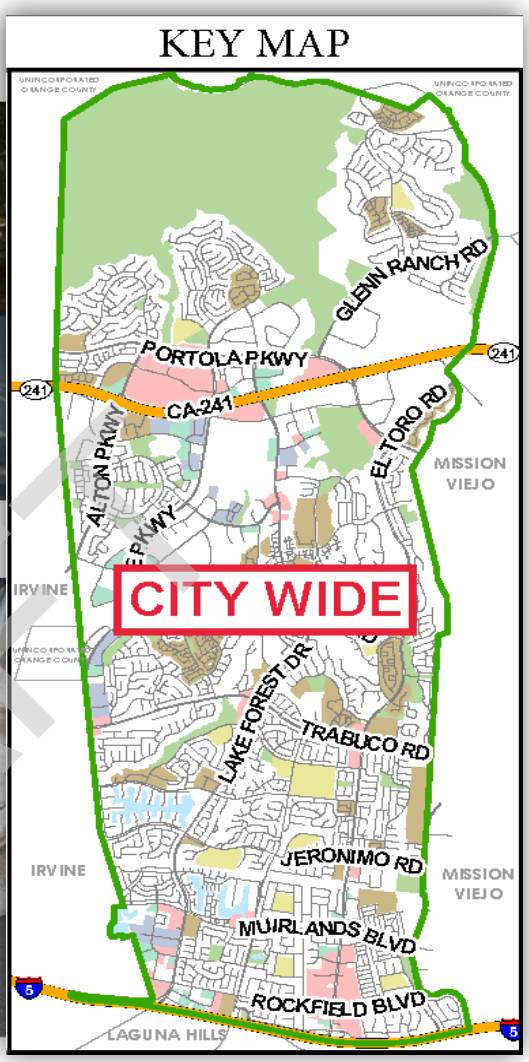
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 375,000
Total Estimate	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 375,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Gas Tax HUTA (210)	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 75,000	$ 375,000
						$ -
						$ -
Total Revenue	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 75,000**	**$ 375,000**

DRAFT

PROJECT NUMBER/NAME: PW# / CDBG - ADA Ramps Phase 13
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Streets



PROJECT DESCRIPTION:
This project would reconstruct existing sidewalk access ramps to comply with current standards and requirements of the Americans with Disabilities Act ("ADA"). This project also implements the City's ADA self-assessment and transition plan. To date, this program has completed 482 of 800 ramps at various locations within the City. The schedule for the design and construction of Phase 13 would depend on the annual allocation of Community Development Block Grant (CDBG) funds.

PROJECT NUMBER/NAME: PW# / CDBG - ADA Ramps Phase 13
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Streets

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively ehannce the visual character of the City and plan for maintenance of all City assets.

Implementation of ADA self-assessment and transition plan provides an investment and maintenance of infrastructure proactively enhancing the visual character of the City, supporting quality neighborhoods and maintenance of City assets.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance, which would help control or reduce sidewalk, risk management, and operating costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design		$ 25,000		$ 25,000		$ 50,000
Construction		$ 100,000		$ 100,000		$ 200,000
Total Estimate	**$ -**	**$ 125,000**	**$ -**	**$ 125,000**	**$ -**	**$ 250,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CDBG (260)	$ -	$ 125,000	$ -	$ 125,000	$ -	$ 250,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 125,000**	**$ -**	**$ 125,000**	**$ -**	**$ 250,000**

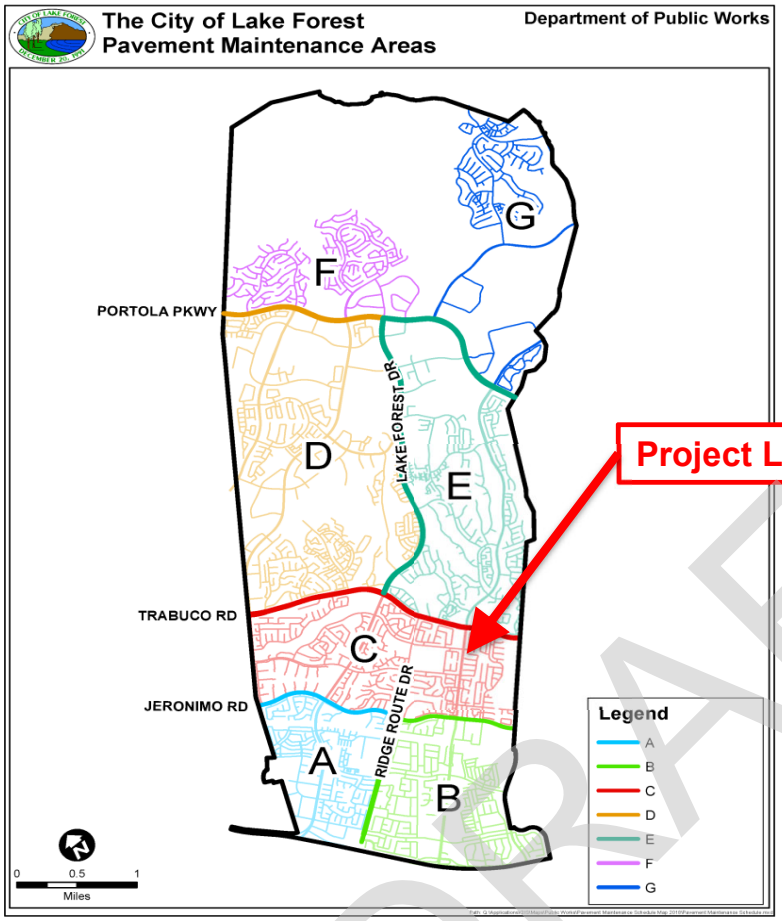
Note: CDBG funding in Fiscal Year 2021-22 and 2023-24 to be programmed toward park improvements. CDBG funding in Fiscal Year 2022-23 to be programmed towards ADA Ramps.

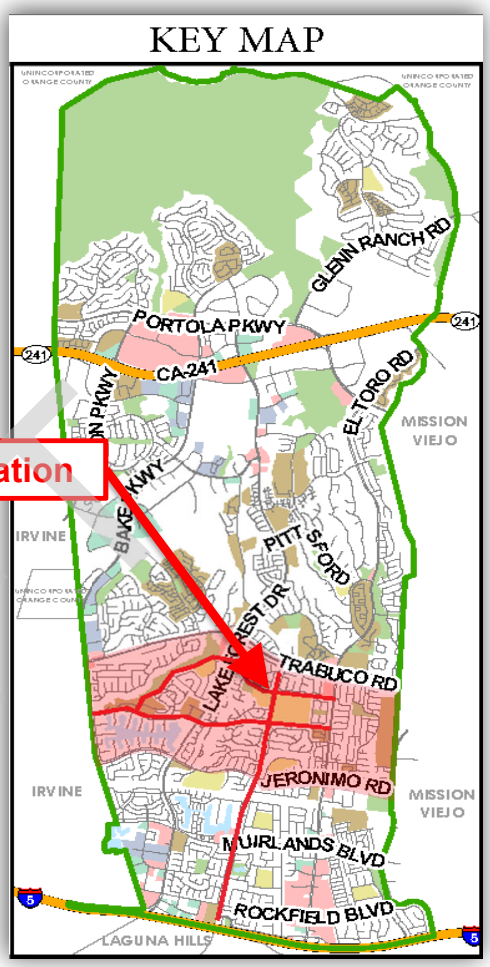
DRAFT

PROJECT NUMBER/NAME: PW# / Annual Pavement Management Program - Street Resurfacing and Slurry Seal

RESPONSIBLE DEPARTMENT: Engineering

CATEGORY: Streets





DRAFT

PROJECT DESCRIPTION:

This project provides asphalt overlays on arterial roadways and slurry seals on collector and residential streets as determined by the Pavement Management Program ("PMP"). The system is designed to avoid expensive deferred maintenance. Conformance with the PMP makes the City eligible for Measure M2 Local Fair Share funding. In FY 2019-20 residential streets in Zone C would be slurried, and Ridge Route from Trabuco to west of Rockfield would be resurfaced. In FY 2020-21 residential streets in Zone G would be slurried. The resurfacing project for FY 2020-21 would be determined upon completion of the Pavement Management Plan report due in late spring 2019.

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Attractive

Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

Maintaining a "Good" Pavement Condition Index (80 PCI), helps to sustain the quality of the pavement in the city and extend the useful life.

PROJECT NUMBER/NAME: PW# / Annual Pavement Management Program - Street Resurfacing and Slurry Seal
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Streets

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the pavement by an estimated average of 30% (Source: American Public Works Association). Recurring resurfacing also reduces risk management costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

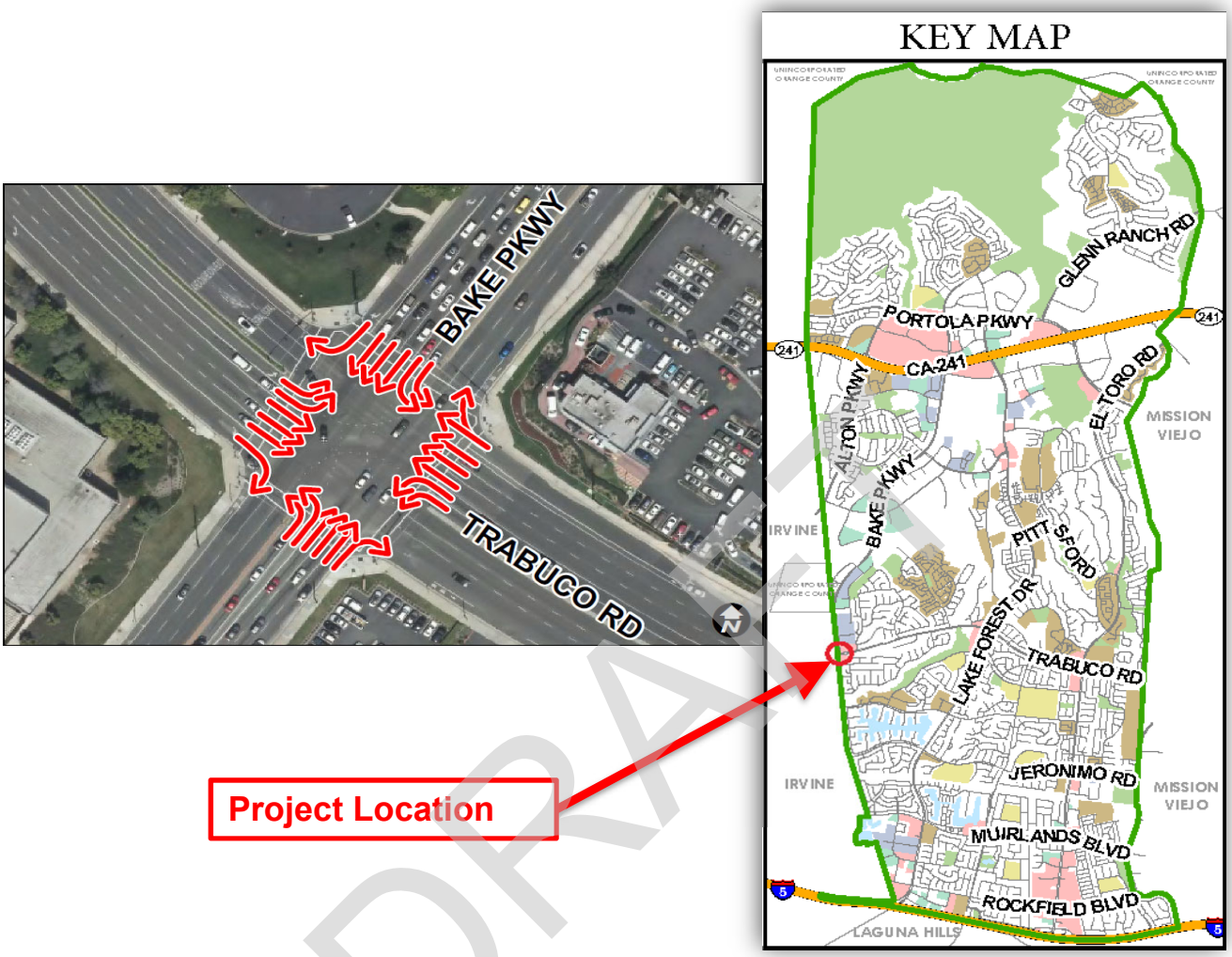
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design	$ 464,400	$ 464,400	$ 451,100	$ 295,100	$ 300,800	$ 1,975,800
Construction	$ 4,179,600	$ 4,179,600	$ 4,059,719	$ 2,655,993	$ 2,707,238	$ 17,782,150
Total Estimate	**$ 4,644,000**	**$ 4,644,000**	**$ 4,510,819**	**$ 2,951,093**	**$ 3,008,038**	**$ 19,757,950**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
M2 LFS (220)	$ 1,440,844	$ 1,476,865	$ 1,512,310	$ 1,547,093	$ 1,604,038	$ 7,581,150
Gas Tax RMRA (211)	$ 1,404,000	$ 1,404,000	$ 1,404,000	$ 1,404,000	$ 1,404,000	$ 7,020,000
Gas Tax HUTA (210)	$ -	$ -				$ -
Infras Reserve (150)	$ 1,799,156	$ 1,763,135	$ 1,594,509			$ 5,156,800
Total Revenue	**$ 4,644,000**	**$ 4,644,000**	**$ 4,510,819**	**$ 2,951,093**	**$ 3,008,038**	**$ 19,757,950**

The Infrastrucutre Reserve of $7,000,000 approved in Fiscal Year 2018-19 would be depleted at the end of FY 2021-22.

DRAFT

PROJECT NUMBER/NAME: PW# / Bake / Trabuco / Irvine Intersection Improvements
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements



DRAFT

PROJECT DESCRIPTION:
The project would convert the northbound dedicated right turn lane on Trabuco into a 4th through/right lane; restripe the southbound #3 through lane on Irvine Bouldvard into a through/right lane; add a second eastbound left turn lane on Bake Parkway; restore the second left turn lane on westbound Bake; and provide a dedicated right turn lane on eastbound Bake. This project is item 4 of the Lake Forest Transportation Mitigation (LFTM) program.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Well planned
Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking
This project would promote improved traffic flow and safety at this intersection.

T1

PROJECT NUMBER/NAME: PW# / Bake / Trabuco / Irvine Intersection Improvements
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

PRIOR YEAR FUNDING FY17-18 - $40,000 Design, FY18-19 $80,000 Design $275,000 R/W

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land	$ 294,000					$ 294,000
Planning/Design						$ -
Construction	$ 844,000					$ 844,000
Total Estimate	**$ 1,138,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,138,000**

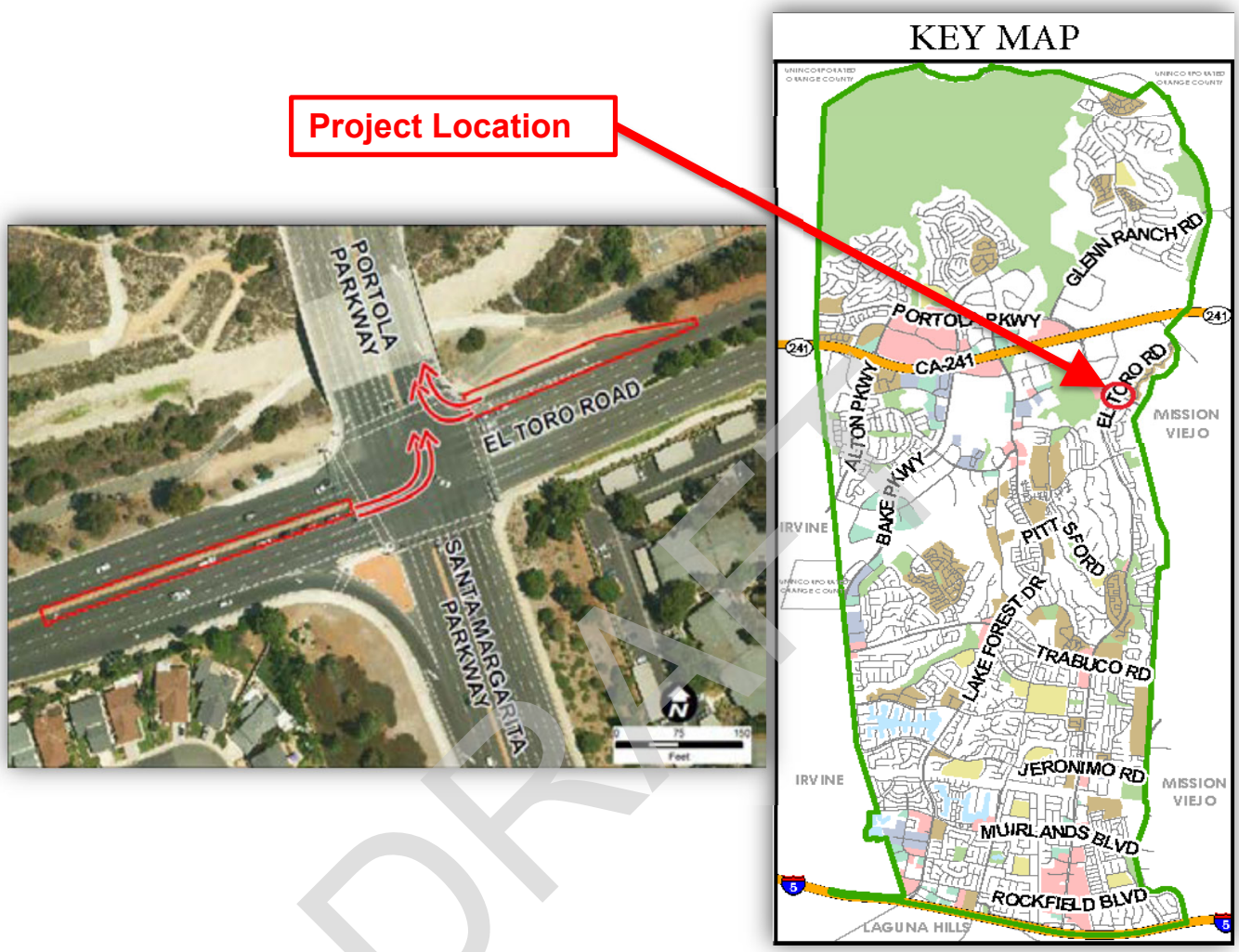
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
LFTM (511)	$ 1,138,000	$ -	$ -	$ -	$ -	$ 1,138,000
						$ -
						$ -
Total Revenue	**$ 1,138,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 1,138,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Second Eastbound Left Turn Lane and 2nd Westbound Right Turn Lane on El Toro at Portola/Santa Margarita

RESPONSIBLE DEPARTMENT: Traffic Engineering

CATEGORY: Traffic Improvements



DRAFT

PROJECT DESCRIPTION:

This project would add a second eastbound left turn lane on El Toro and a second dedicated westbound right turn lane on El Toro to mitigate the future traffic impacts that are identified in LFTM. The City conducted additional traffic analysis in the AM and PM peak periods to determine if other improvements could be implemented in lieu of the second right turn lane. None of the alternative improvements adequately mitigated the future traffic impacts identified in LFTM and therefore the second right turn lane must be provided to meet the required LOS at this intersection. The project is fully funded by LFTM. This project is item 3 of the Lake Forest Transportation Mitigation (LFTM) program.

PROJECT NUMBER/NAME: PW# / Second Eastbound Left Turn Lane and 2nd Westbound Right Turn Lane on El Toro at Portola/Santa Margarita

RESPONSIBLE DEPARTMENT: Traffic Engineering

CATEGORY: Traffic Improvements

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Well planned

Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety at this intersection.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:

This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

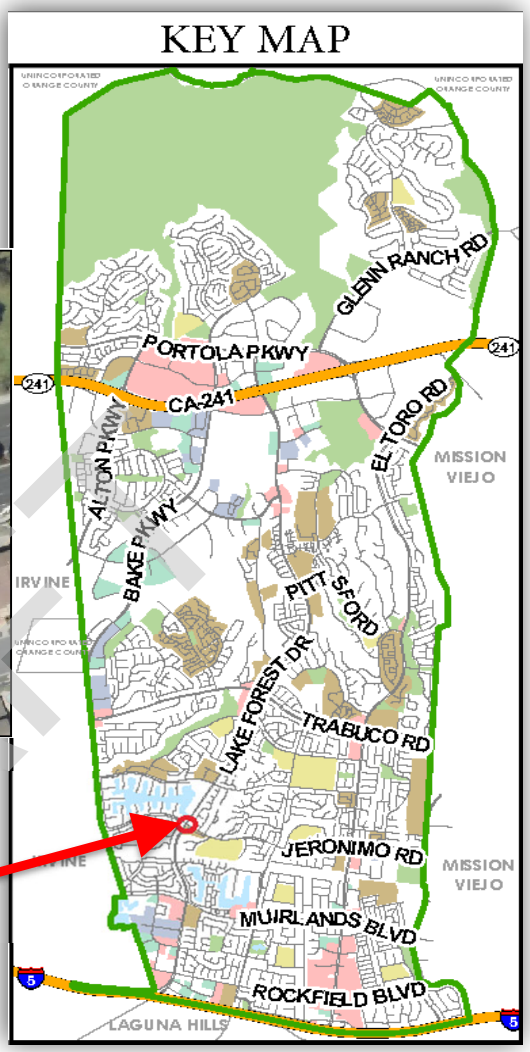
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land	$ 659,000					$ 659,000
Planning/Design						$ -
Construction		$ 1,623,200				$ 1,623,200
Total Estimate	**$ 659,000**	**$ 1,623,200**	**$ -**	**$ -**	**$ -**	**$ 2,282,200**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
LFTM (511)	$ 659,000	$ 1,623,200	$ -			$ 2,282,200
						$ -
						$ -
Total Revenue	**$ 659,000**	**$ 1,623,200**	**$ -**	**$ -**	**$ -**	**$ 2,282,200**

DRAFT

PROJECT NUMBER/NAME: PW# / Widening of Southbound Jeronimo at Lake Forest Drive
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements



Project Location

DRAFT

PROJECT DESCRIPTION:
This project would widen southbound Jeronimo at Lake Forest by approximately three feet to create an eight-foot wide bike lane/de facto southbound right turn lane. This project is item 6 on the Lake Forest Transportation Mitigation (LFTM) program.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Well planned
Strategic Plan Strategy:	Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# / Widening of Southbound Jeronimo at Lake Forest Drive
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land		$ 7,500				$ 7,500
Planning/Design		$ 28,000				$ 28,000
Construction			$ 116,100			$ 116,100
Total Estimate	**$ -**	**$ 35,500**	**$ 116,100**	**$ -**	**$ -**	**$ 151,600**

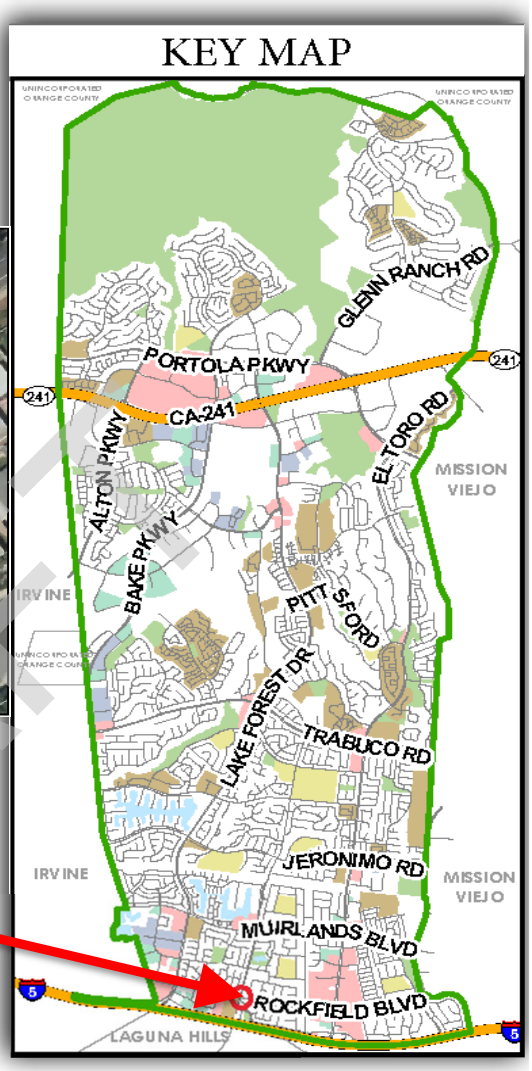
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
LFTM (511)	$ -	$ 35,500	$ 116,100	$ -	$ -	$ 151,600
						$ -
						$ -
Total Revenue	**$ -**	**$ 35,500**	**$ 116,100**	**$ -**	**$ -**	**$ 151,600**

DRAFT

PROJECT NUMBER/NAME: PW# / Dedicated Right Turn Lane on EB Ridge Route Drive at Rockfield Blvd

RESPONSIBLE DEPARTMENT: Traffic Engineering

CATEGORY: Traffic Improvements



DRAFT

PROJECT DESCRIPTION:

This project would remove on-street parking in a parking-impacted location on the south side of Ridge Route Drive, west of Rockfield Boulevard to increase the eastbound curb lane width from 12 feet to 20 feet to provide a de facto right turn only lane. This project is item 8 on the Lake Forest Transportation Mitigation (LFTM) program.

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Well planned

Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# / Dedicated Right Turn Lane on EB Ridge Route Drive at Rockfield Blvd
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 2,300					$ 2,300
Total Estimate	**$ 2,300**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 2,300**

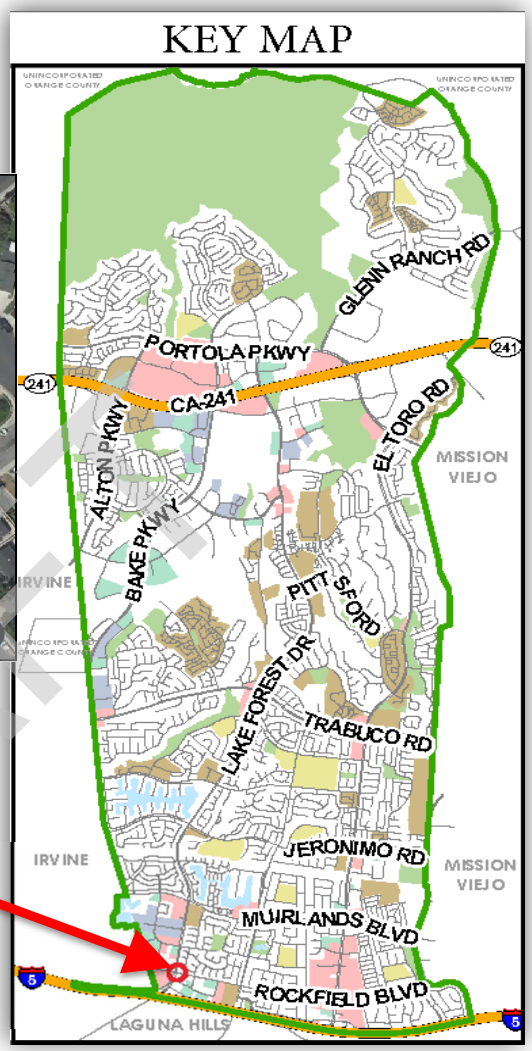
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
LFTM (511)	$ 2,300					$ 2,300
						$ -
						$ -
Total Revenue	**$ 2,300**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 2,300**

DRAFT

PROJECT NUMBER/NAME: PW# / Lake Forest & Rockfield Restriping / Split Phase Signaling

RESPONSIBLE DEPARTMENT: Traffic Engineering

CATEGORY: Traffic Improvements



DRAFT

PROJECT DESCRIPTION:

This project would re-stripe the northbound Rockfield Boulevard approach for two northbound left-turn lanes, one northbound left-thru shared lane, and one northbound through lanes. Re-striping requires a modification of the traffic signal for split phased operation on the southbound and northbound Rockfield Boulevard approaches. This project is item 7 on the Lake Forest Transportation Mitigation (LFTM) program.

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Well planned

Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air

This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# / Lake Forest & Rockfield Restriping / Split Phase Signaling
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design	$ 11,000					$ 11,000
Construction		$ 56,200				$ 56,200
Total Estimate	**$ 11,000**	**$ 56,200**	**$ -**	**$ -**	**$ -**	**$ 67,200**

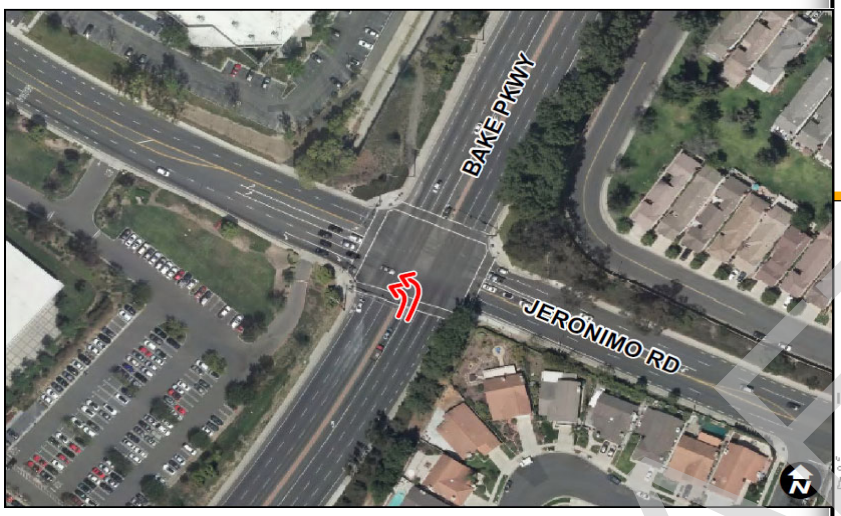
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
LFTM (511)	$ 11,000	$ 56,200				$ 67,200
						$ -
						$ -
Total Revenue	**$ 11,000**	**$ 56,200**	**$ -**	**$ -**	**$ -**	**$ 67,200**

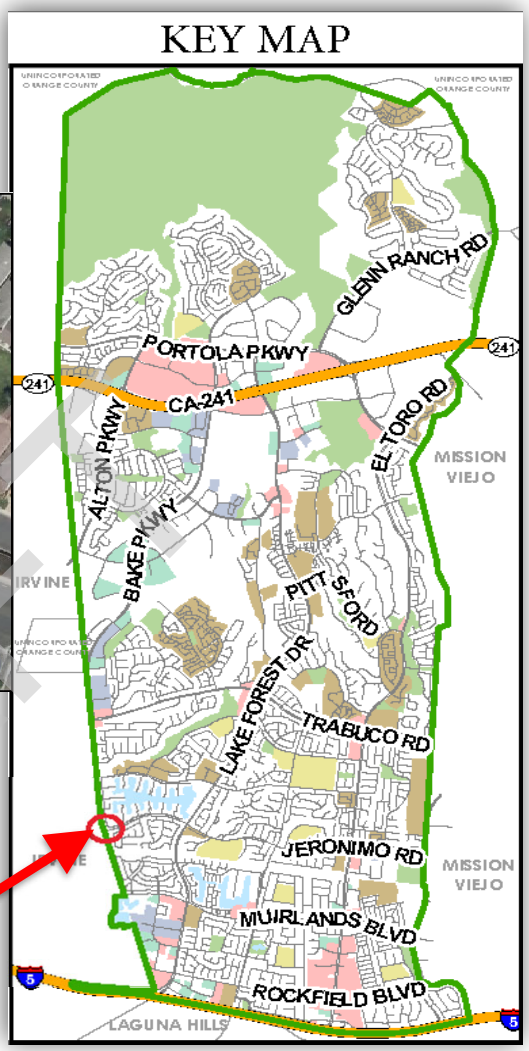
DRAFT

PROJECT NUMBER/NAME: PW# / Second Eastbound Left Turn Lane on Bake Parkway at Jeronimo

RESPONSIBLE DEPARTMENT: Traffic Engineering

CATEGORY: Traffic Improvements





Project Location

DRAFT

PROJECT DESCRIPTION:

This intersection has several improvements planned as part of LFTM, NITM and the County mitigation for the MPAH amendment on Santiago Canyon Road. The currently identified project for LFTM is the 2nd EB left turn lane on Bake. For NITM there is duplicate funding for this left turn lane and funding for a 4th westbound through lane thru the intersection. The City is working with both agencies to determine if additional/alternative improvements, including a 2nd northbound left turn lane on Jeronimo, can be implemented. The 2018 updated LFTM estimate is $1,063,500 + 25% =$1,329,375. NITM currently has about $2 million budgeted for this project.

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Well planned

Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air

This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# / Second Eastbound Left Turn Lane on Bake Parkway at Jeronimo
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land			$ 104,000			$ 104,000
Planning/Design		$ 235,000				$ 235,000
Construction			$ 724,500			$ 724,500
Total Estimate	**$ -**	**$ 235,000**	**$ 828,500**	**$ -**	**$ -**	**$ 1,063,500**

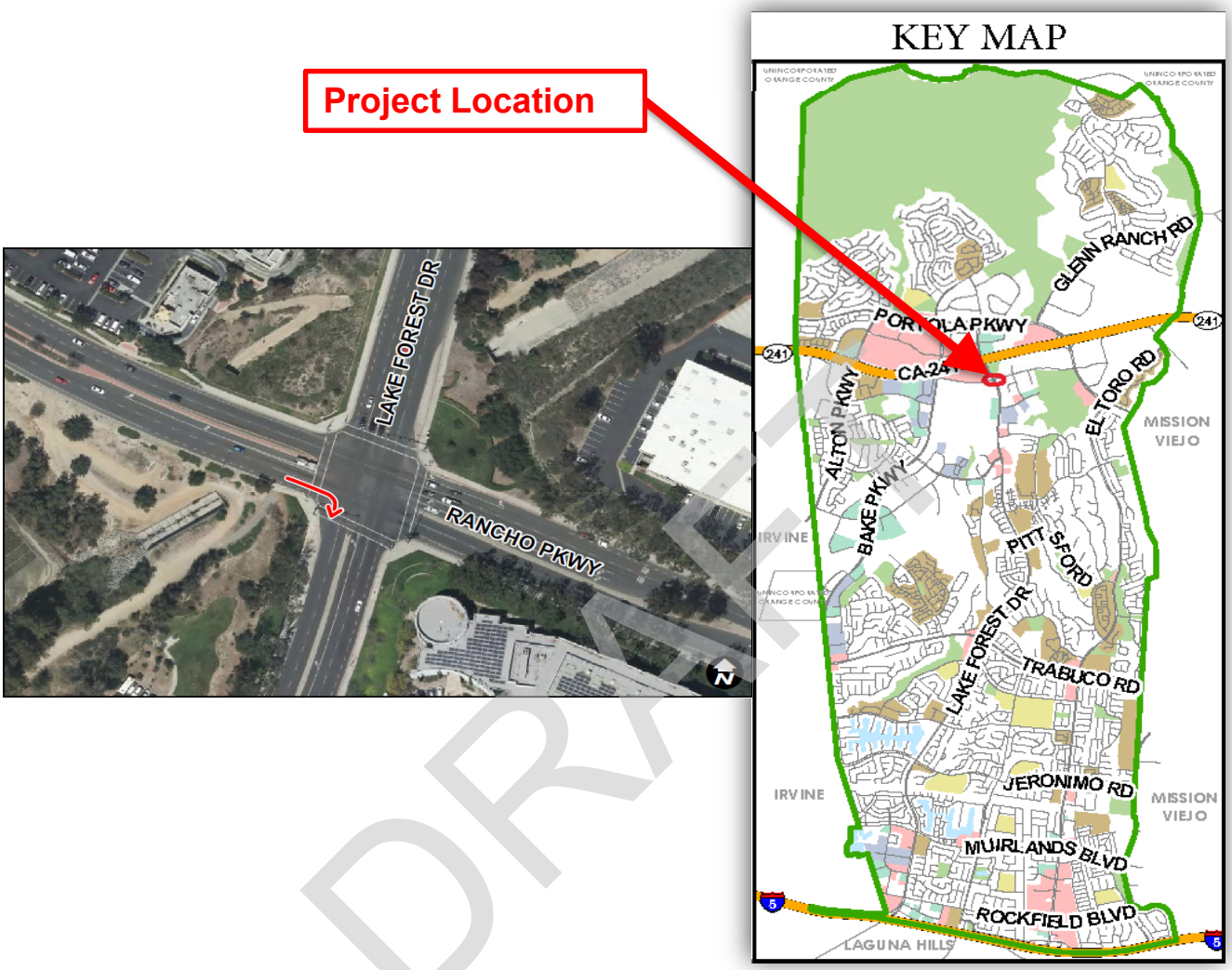
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
LFTM (511)	$ -	$ 235,000	$ 828,500			$ 1,063,500
						$ -
						$ -
Total Revenue	**$ -**	**$ 235,000**	**$ 828,500**	**$ -**	**$ -**	**$ 1,063,500**

DRAFT

PROJECT NUMBER/NAME: PW# / Southbound Rancho Parkway Widening at Lake Forest Drive for Dedicated Right Turn Lane

RESPONSIBLE DEPARTMENT: Traffic Engineering

CATEGORY: Traffic Improvements



DRAFT

PROJECT DESCRIPTION:

This project would widen southbound Rancho Parkway to create an eight foot wide bike lane/de facto right turn.

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Well planned

Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# / Southbound Rancho Parkway Widening at Lake Forest Drive for Dedicated Right Turn Lane
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land			$ 24,000			$ 24,000
Planning/Design		$ 60,000				$ 60,000
Construction				$ 224,000		$ 224,000
Total Estimate	**$ -**	**$ 60,000**	**$ 24,000**	**$ 224,000**	**$ -**	**$ 308,000**

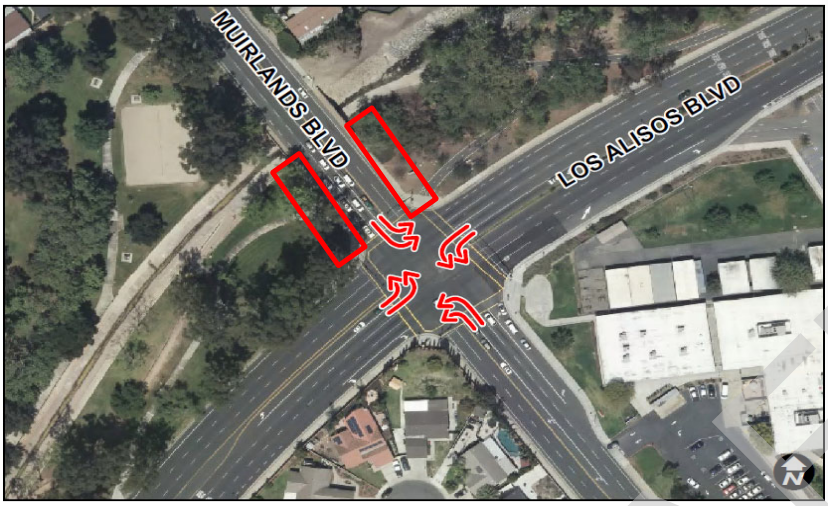
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
LFTM (511)	$ -	$ 60,000	$ 24,000	$ 224,000	$ -	$ 308,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 60,000**	**$ 24,000**	**$ 224,000**	**$ -**	**$ 308,000**

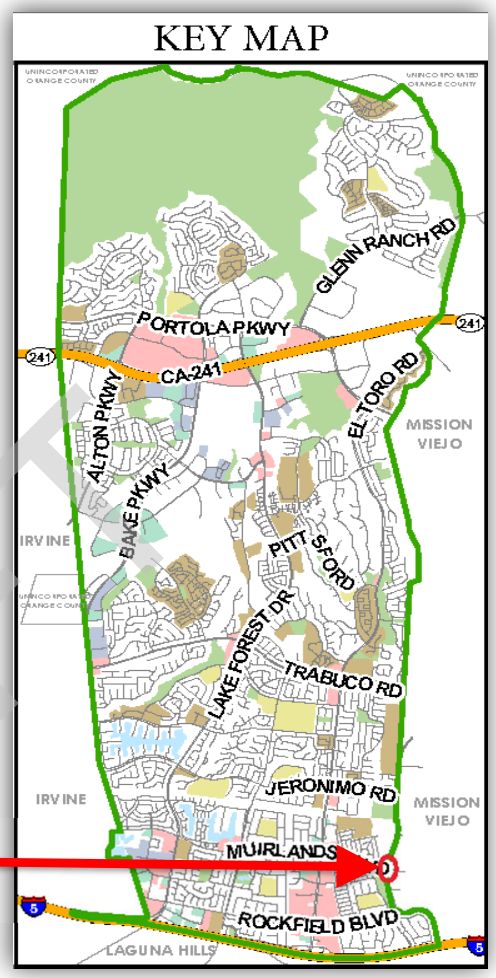
DRAFT

PROJECT NUMBER/NAME: PW# /Second Left Turn Lanes in All Directions at the Intersection of Los Alisos and Muirlands

RESPONSIBLE DEPARTMENT: Traffic Engineering

CATEGORY: Traffic Improvements





Project Location

DRAFT

PROJECT DESCRIPTION:

This Foothill Circulation Phasing Program (FCPP) project would consist of widening, median modifications and restriping to provide a second left turn lane for each of the four approach legs. It requires approximately 7,200 square feet of additional right-of-way and widening of the bridge over Aliso Creek. This project requires coordination with the City of Mission Viejo.

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Well planned

Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# /Second Left Turn Lanes in All Directions at the Intersection of Los Alisos and Muirlands
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

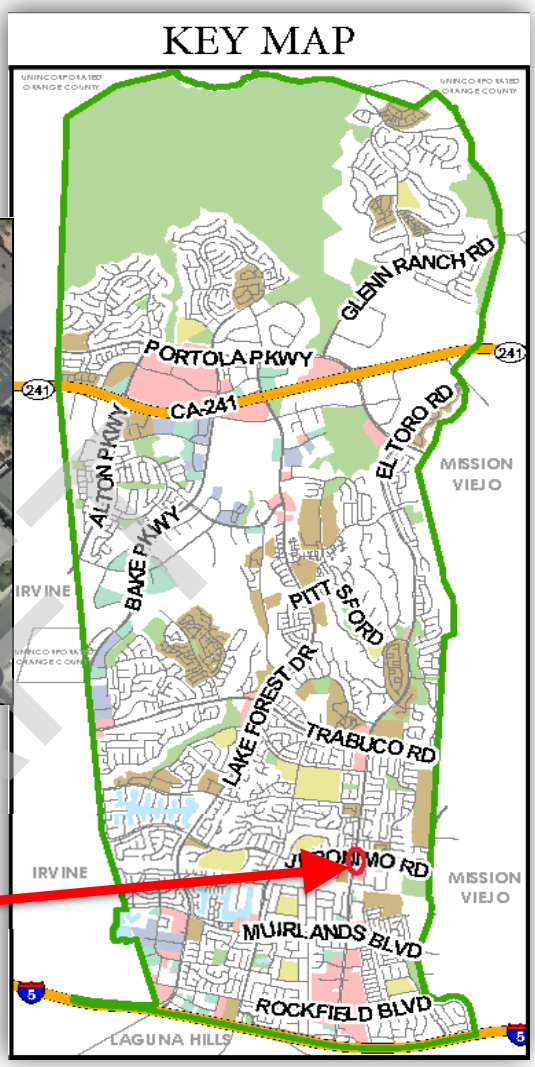
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land		$ 1,450,000				$ 1,450,000
Planning/Design	$ 450,000					$ 450,000
Construction			$ 1,525,000			$ 1,525,000
Total Estimate	**$ 450,000**	**$ 1,450,000**	**$ 1,525,000**	**$ -**	**$ -**	**$ 3,425,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
FCPP (512)	$ 450,000	$ 1,450,000	$ 1,525,000			$ 3,425,000
						$ -
						$ -
Total Revenue	**$ 450,000**	**$ 1,450,000**	**$ 1,525,000**	**$ -**	**$ -**	**$ 3,425,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Widening/Realignment of Jeronimo at El Toro Road
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements



Project Location

DRAFT

PROJECT DESCRIPTION:
This Foothill Circulation Phasing Program (FCPP) project would consist of widening Jeronimo north and south of El Toro to correct an existing misalignment of the through lanes. A Right of Way acquisition of approximately 4,750 SF and construction of a retaining wall along the northwest corner of Jeronimo would be required to accommodate the widening. Eastbound and westbound El Toro Road would be restriped for an additional left turn lane in each direction.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Well planned
Strategic Plan Strategy:	Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# / Widening/Realignment of Jeronimo at El Toro Road
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

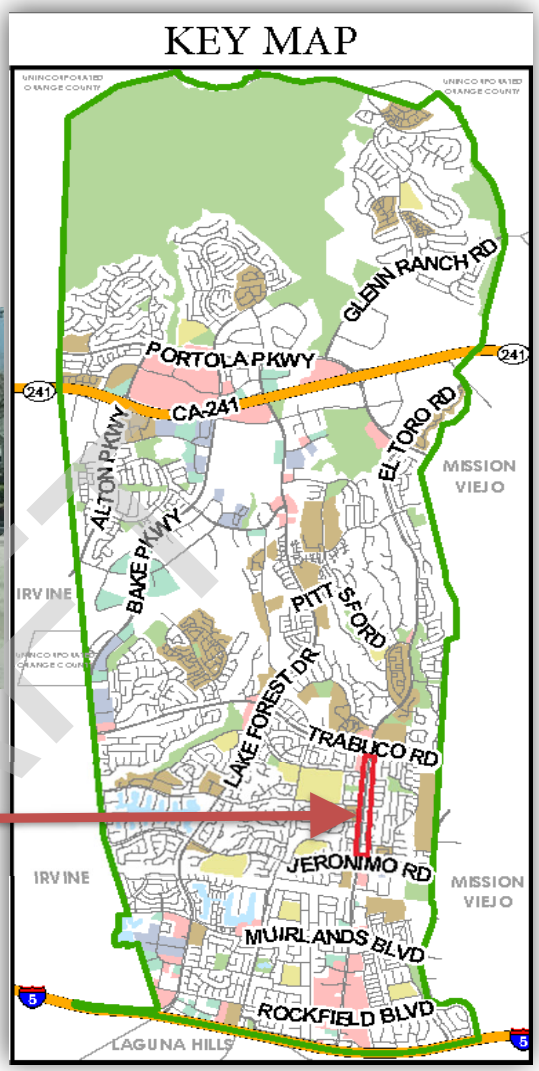
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land		$ 250,000				$ 250,000
Planning/Design	$ 100,000					$ 100,000
Construction		$ 450,000				$ 450,000
Total Estimate	**$ 100,000**	**$ 700,000**	**$ -**	**$ -**	**$ -**	**$ 800,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
FCPP (512)	$ 100,000	$ 700,000				$ 800,000
						$ -
						$ -
Total Revenue	**$ 100,000**	**$ 700,000**	**$ -**	**$ -**	**$ -**	**$ 800,000**

DRAFT

PROJECT NUMBER/NAME: PW# / El Toro Raised Medians from Jeronimo to Trabuco
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements



Project Location

DRAFT

PROJECT DESCRIPTION:
This Foothill Circulation Phasing Program (FCPP) project would consist of replacing the existing painted medians along El Toro Road from Jeronimo to Trabuco with raised medians. Staff will evaluate the possibility of utilizing a planted median or a stamped concrete median based upon funding availability at the time of project design.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Well planned
Strategic Plan Strategy:	Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety along this portion of El Toro Road.

PROJECT NUMBER/NAME: PW# / El Toro Raised Medians from Jeronimo to Trabuco
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
There is an anticipated annual landscape maintenance increase of an unknown amount for irrigation and landscape maintenance to the General Fund. Estimated costs would be able to be determined once final design of the project is complete.

NO PRIOR YEAR FUNDING

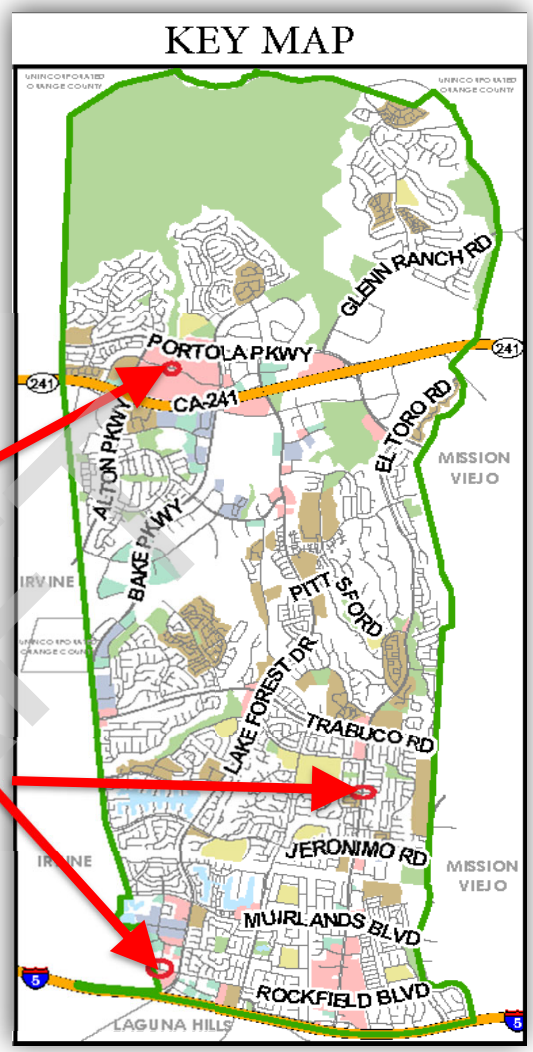
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design		$ 100,000				$ 100,000
Construction			$ 800,000			$ 800,000
Total Estimate	**$ -**	**$ 100,000**	**$ 800,000**	**$ -**	**$ -**	**$ 900,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
FCPP (512)	$ -	$ 100,000	$ 800,000			$ 900,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 100,000**	**$ 800,000**	**$ -**	**$ -**	**$ 900,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Protective Permissive Left Turn Phasing Program
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements



Protective/Permissive Intersections

Pedestrian Phasing Intersection

DRAFT

PROJECT DESCRIPTION:
This project would install protective permissive left turn phasing ("PPLTP") at two intersections (Towne Centre and Market Place and Rockfield and Centre Drive) modify the pedestrian phasing at a third intersection (El Toro and Toledo). PPLTP allows drivers to turn left with a protected green arrow as well as the ability to turn left of the green ball when there are sufficient gaps in the traffic. The following additional locations are proposed for future years:

Alton Parkway & Monarch Boulevard – north-south along Monarch Boulevard
Alton Parkway & Catalina – north-south along Catalina
Bake Parkway & Towne Centre Drive – north-south along Towne Centre Drive
Lake Forest Drive & Towne Centre Drive – north-south along Towne Centre Drive

PROJECT NUMBER/NAME: PW# / Protective Permissive Left Turn Phasing Program
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Well planned
Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking

This project would promote improved traffic flow and safety at these intersections.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

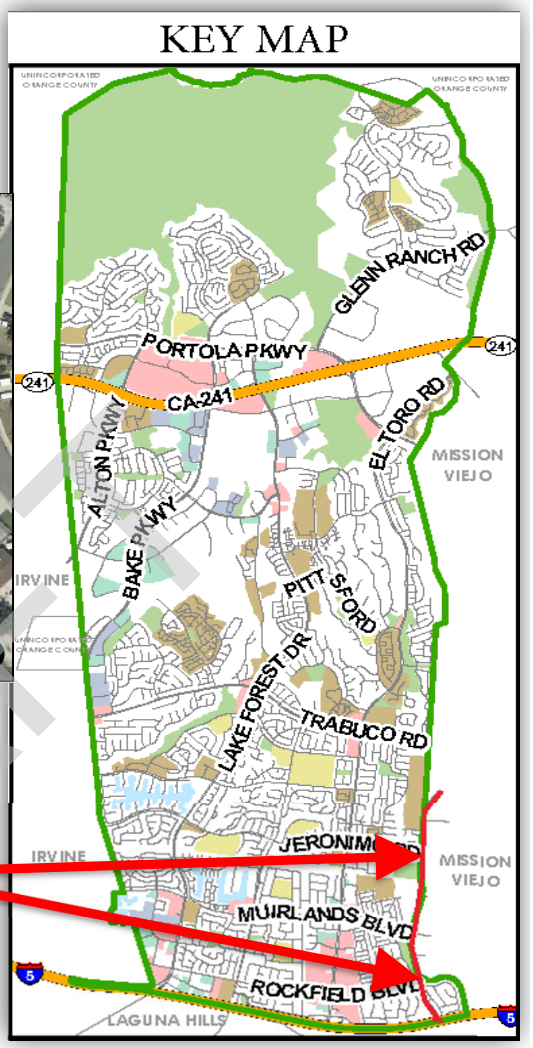
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design	$ 60,000					$ 60,000
Construction	$ 140,000	$ 100,000				$ 240,000
Total Estimate	**$ 200,000**	**$ 100,000**	**$ -**	**$ -**	**$ -**	**$ 300,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Gas Tax HUTA (211)	$ 200,000	$ 100,000				$ 300,000
						$ -
						$ -
Total Revenue	**$ 200,000**	**$ 100,000**	**$ -**	**$ -**	**$ -**	**$ 300,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Los Alisos Traffic Signal Synchronization Program
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements



Project Location

DRAFT

PROJECT DESCRIPTION:
The Los Alisos Boulevard Traffic Signal Synchronization Program (TSSP) project would update traffic signal coordination timing and update communication and other traffic signal hardware for the traffic signals on Los Alisos Boulevard from Laguna Hills to Mission Viejo. The City has one traffic signal on this corridor and the total estimated project cost for this signal is $65,000. Should the City receive the grant funding, OCTA would pay 80% of the costs and the cities of Lake Forest and Mission Viejo would pay the remaining 20% for the signals in their respective jurisdictions.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Well planned
Strategic Plan Strategy: Prioritize initiatives to reduce traffic congestion, improve air quality, and manage on-street parking
This project would promote improved traffic flow and safety at this intersection.

PROJECT NUMBER/NAME: PW# / Los Alisos Traffic Signal Synchronization Program
RESPONSIBLE DEPARTMENT: Traffic Engineering
CATEGORY: Traffic Improvements

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide a reduction in traffic congestion, improvement in operations, enhancement of traffic signal infrastructure, which may help reduce retrofit, improvement, and signal maintenance operating costs.

NO PRIOR YEAR FUNDING

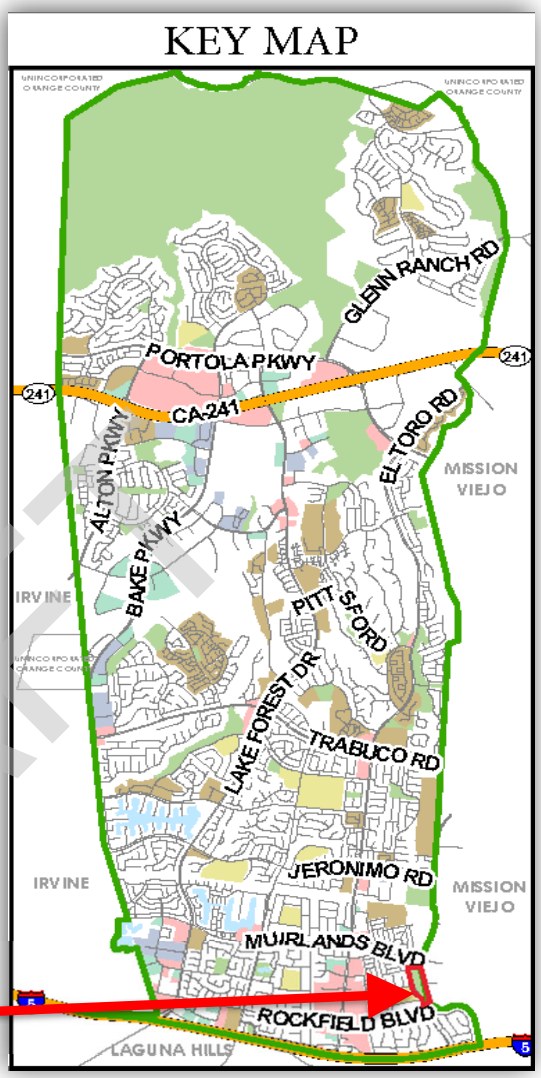
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 18,000					$ 18,000
Total Estimate	**$ 18,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 18,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
SCAQMD (235)	$ 18,000					$ 18,000
						$ -
						$ -
Total Revenue	**$ 18,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 18,000**

DRAFT

PROJECT NUMBER/NAME: PW# / CDBG - El Toro Park Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



Project Location

DRAFT

PROJECT DESCRIPTION:
This project would perform repairs to park lighting, replace benches, and make improvements to the tennis courts, as well as install safety mechanisms to reduce instances of vandalism to the restrooms.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.
The project would make repairs to existing park facilities and replace amenities.

PROJECT NUMBER/NAME: PW# / CDBG - El Toro Park Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

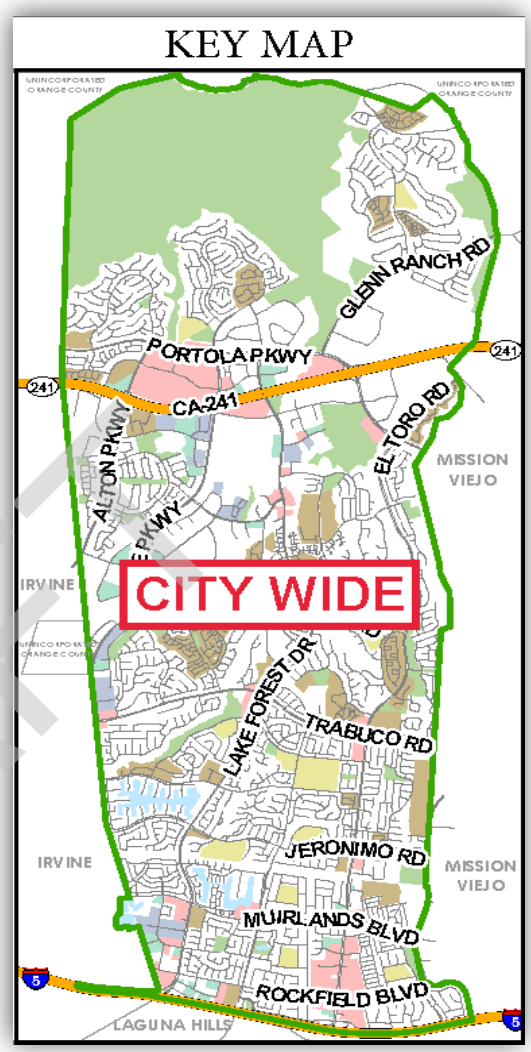
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 132,500		$ 125,000		$ 125,000	$ 382,500
Total Estimate	**$ 132,500**	**$ -**	**$ 125,000**	**$ -**	**$ 125,000**	**$ 382,500**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CDBG (260)	$ 132,500		$ 125,000		$ 125,000	$ 382,500
						$ -
						$ -
Total Revenue	**$ 132,500**	**$ -**	**$ 125,000**	**$ -**	**$ 125,000**	**$ 382,500**

Note: CDBG funding in Fiscal Year 2021-22 and 2023-24 to be programmed toward park improvements. CDBG funding in Fiscal Year 2022-23 to be programmed towards ADA Ramps.

DRAFT

PROJECT NUMBER/NAME: PW# / Sports Court Resurfacing Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
This project would perform repairs necessary to rehabilitate and maintain the playability of the existing sport courts (tennis, handball, hockey, and basketball courts) citywide. Each court would be evaluated to determine the necessary repairs needed, such as sealant and concrete repairs, markings, painting, chain link fence, equipment and screen repairs and/or replacements. This project would also apply surface gritted paint to ensure playability and safety of the users. Eighteen park sites are identified for inspection/evaluation under this project with repairs being performed as needed.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The resurfacing of the sports courts would improve play surface condition.

PROJECT NUMBER/NAME: PW# / Sports Court Resurfacing Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets. Recurring resurfacing also reduces risk management costs.

NO PRIOR YEAR FUNDING

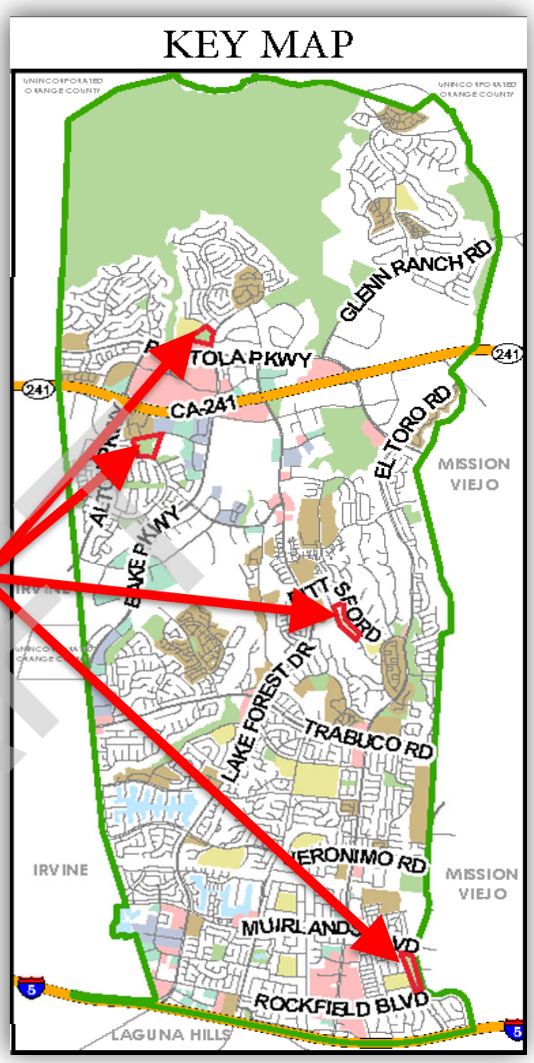
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction		$ 32,500		$ 32,500		$ 65,000
Total Estimate	**$ -**	**$ 32,500**	**$ -**	**$ 32,500**	**$ -**	**$ 65,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)		$ 32,500		$ 32,500		$ 65,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 32,500**	**$ -**	**$ 32,500**	**$ -**	**$ 65,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Playground Resurfacing Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



Project Locations

DRAFT

PROJECT DESCRIPTION:
This project would make repairs to playground surfaces in preparation of a sealant coat application on the resilient playground surfaces. This sealant application elongates the useful life of the existing playground resilient surfaces by delaying sun damage susceptibility. Some parks require full replacement of the resilient surface, which is accounted for in the project budget. The following parks - Pittsford Park (3,500 sq. ft.), El Toro Park (1,000 sq. ft.), Baker Ranch (2,000 sq. ft.), Borrego Overlook (800 sq. ft.) would be repaired in FY 2019-20.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.
The maintenance and resurfacing of the resilient playground surfaces would improve play surface condition.

PROJECT NUMBER/NAME: PW# / Playground Resurfacing Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets. Recurring resurfacing also reduces risk management costs.

NO PRIOR YEAR FUNDING

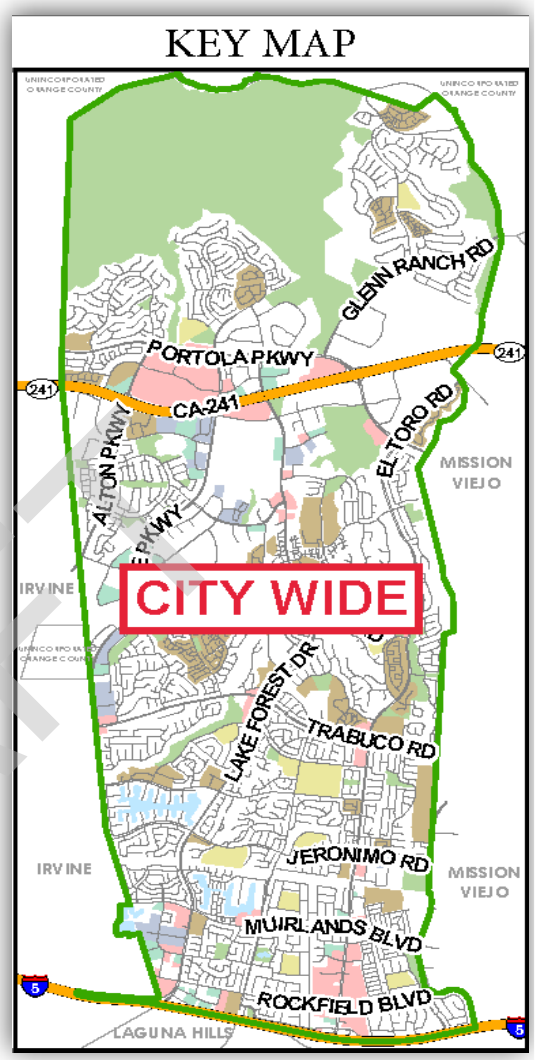
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 225,000		$ 50,000		$ 50,000	$ 325,000
Total Estimate	**$ 225,000**	**$ -**	**$ 50,000**	**$ -**	**$ 50,000**	**$ 325,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 225,000		$ 50,000		$ 50,000	$ 325,000
						$ -
						$ -
Total Revenue	**$ 225,000**	**$ -**	**$ 50,000**	**$ -**	**$ 50,000**	**$ 325,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Park Sidewalk Rehabilitation Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
This project would remove and replace sidewalk panels within the pedestrian path of travel in all city parks. The parks were evaluated and all sidewalk displacements removed. However, some sections of sidewalk require more extensive repair such as replacement of sections of the sidewalk.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively enhance the visual character of the City and plan for maintenance of all City assets.

Regular sidewalk repair provides a high-quality pedestrian circulation system. Smooth, unbroken surfaces are safer for pedestrians.

PROJECT NUMBER/NAME: PW# / Park Sidewalk Rehabilitation Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance, which would help control or reduce sidewalk, risk management, and operating costs.

NO PRIOR YEAR FUNDING

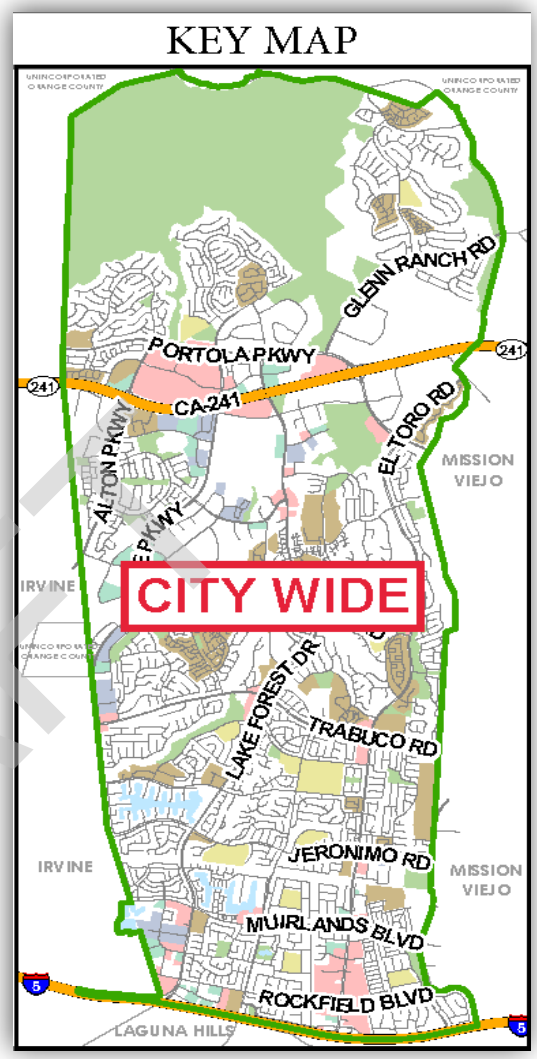
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 50,000	$ 50,000	$ 25,000	$ 25,000	$ 25,000	$ 175,000
Total Estimate	**$ 50,000**	**$ 50,000**	**$ 25,000**	**$ 25,000**	**$ 25,000**	**$ 175,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 50,000	$ 50,000	$ 25,000	$ 25,000	$ 25,000	$ 175,000
						$ -
						$ -
Total Revenue	**$ 50,000**	**$ 50,000**	**$ 25,000**	**$ 25,000**	**$ 25,000**	**$ 175,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Park Amenities Replacements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
This annual project would replace park amenities such as trash enclosures, picnic tables, benches, and drinking fountains at City parks. The condition of park amenities are evaluated by staff and are replaced when needed.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The project would make repairs to existing park facilities and replace amenities.

PROJECT NUMBER/NAME: PW# / Park Amenities Replacements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is not expected to have an impact on the operating budget.

NO PRIOR YEAR FUNDING

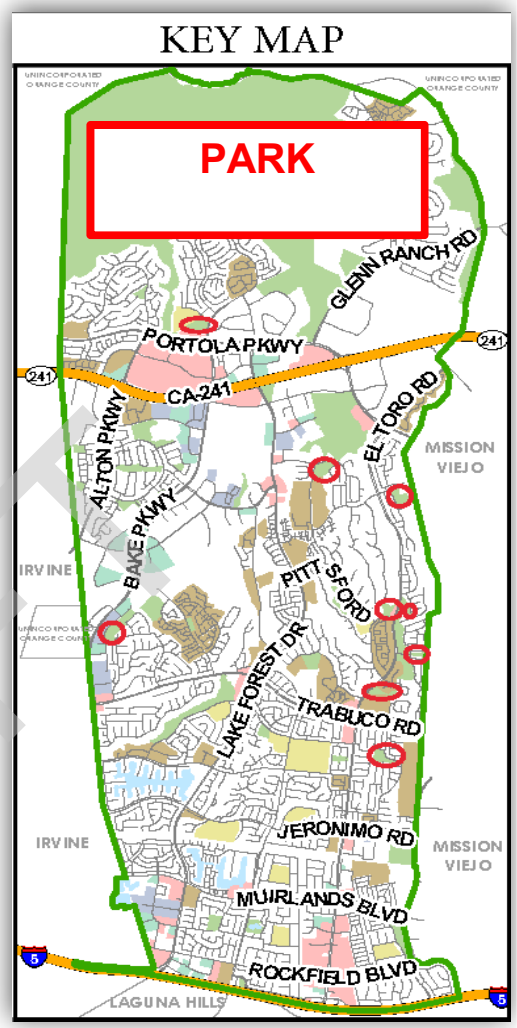
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 200,000
Total Estimate	**$ 40,000**	**$ 40,000**	**$ 40,000**	**$ 40,000**	**$ 40,000**	**$ 200,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 200,000
						$ -
						$ -
Total Revenue	**$ 40,000**	**$ 40,000**	**$ 40,000**	**$ 40,000**	**$ 40,000**	**$ 200,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Neighborhood Park Renovations
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
As part of the 2017-2019 CIP, designs for improvements and renovations at the 10 parks listed below were developed. This project would construct the recommended renovations at these 10 community

The first phase of construction in FY 2019-20 would improve:
- Borrego Overlook Park, Cherry Park, Montbury Park, Pebble Creek Park
The second phase of construction in FY 2020-21 would improve:
- Regency Park, Rancho Serrano Park, Darrin Park, Sundowner Park, Vintage Park

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The project would rehabilitate to existing park facilities and replace amenities.

PROJECT NUMBER/NAME: PW# / Neighborhood Park Renovations
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets.

PRIOR YEAR FUNDING - Design $518,000 Peachwood Construction $350,000

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 3,150,000	$ 3,500,000	$ -			$ 6,650,000
Total Estimate	**$ 3,150,000**	**$ 3,500,000**	**$ -**	**$ -**	**$ -**	**$ 6,650,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
NIP Reserve (160)	$ 3,150,000	$ 3,500,000				$ 6,650,000
						$ -
						$ -
Total Revenue	**$ 3,150,000**	**$ 3,500,000**	**$ -**	**$ -**	**$ -**	**$ 6,650,000**

Note: Improvements at Peachwood Park were advanced to Fiscal Year 2018-19. The Neighborhood Improvement Park Reserve of $7,000,000 approved in Fiscal Year 2018-19 would be depleted at the end of FY 2021-22.

DRAFT

PROJECT NUMBER/NAME: PW# / Park Light Pole Replacements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

DRAFT

PROJECT DESCRIPTION:
This project would replace existing steel light poles within City parks with aluminum poles with LED lighting. Staff has inspected and identified existing light poles within the City parks whose bases are eroding and are in need of replacement. The replacement of the existing steel poles provides an opportunity to install with new aluminum light poles that do not rust and allow for the upgrade to LED lighting. Parks include Concourse, El Toro, Foothill Ranch, Lake Forest, Mountain View, Nature, Ranchwood, Rimgate, and Serrano. This project includes 92 poles and 198 inserts.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

Replacement of damaged light poles throughout City parks.

PROJECT NUMBER/NAME: PW# / Park Light Pole Replacements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets. This project also would provide a reduction in energy costs from conversion to LED lighting.

NO PRIOR YEAR FUNDING

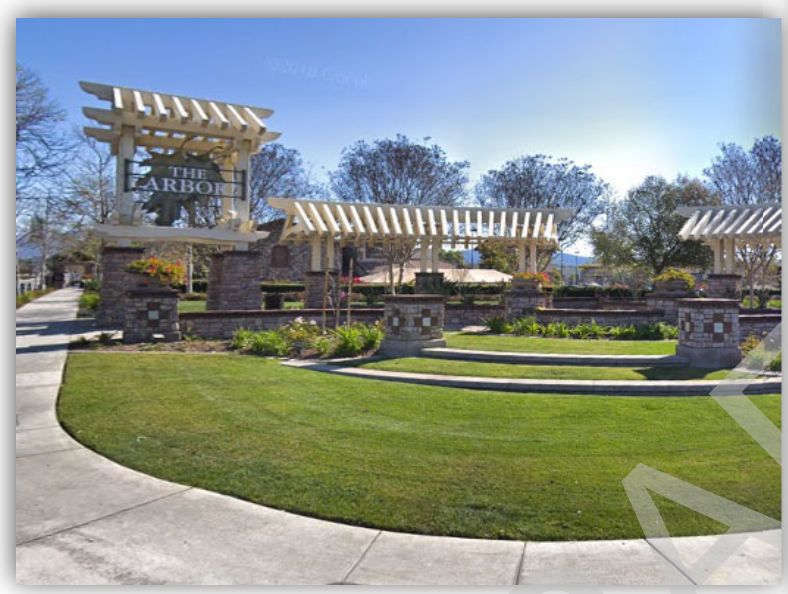
CURRENT AND FUTURE FUNDING

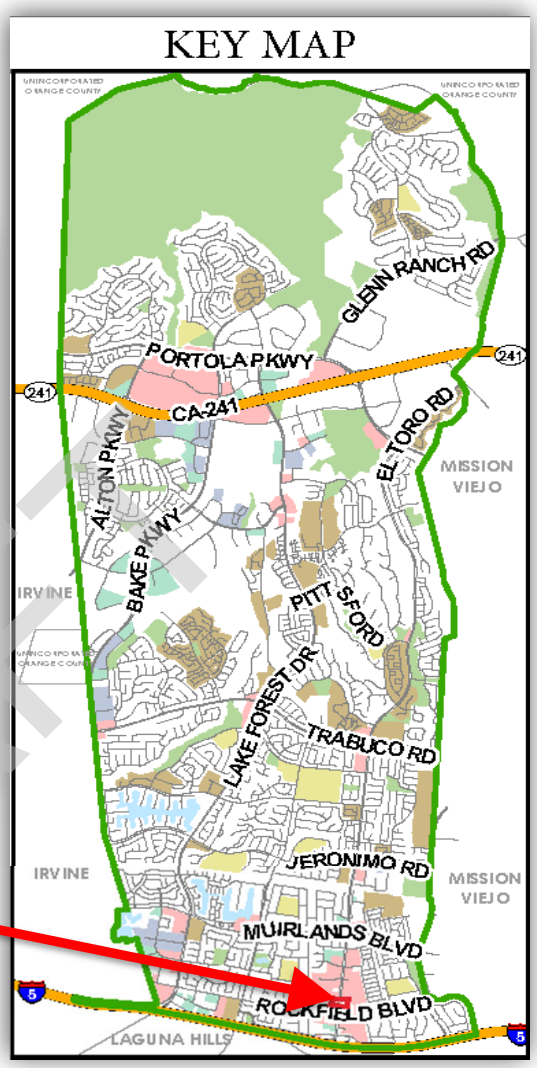
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 325,000					$ 325,000
Total Estimate	**$ 325,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 325,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 325,000					$ 325,000
						$ -
						$ -
Total Revenue	**$ 325,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 325,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Arbor Mini Park (Garden Park)
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation





Project Location

DRAFT

PROJECT DESCRIPTION:
This project would install the facilities and amenities needed to convert the Arbors corners at Rockfield and El Toro Road to a city park with a demonstration garden.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The installation of new facilities and amenities to the Arbors would provide conversion to a city park with demonstration garden.

PROJECT NUMBER/NAME: PW# / Arbor Mini Park (Garden Park)
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is not expected to increase long term operating cost. Annual maintenance would be required from the City's landscape contractor. A level of maintenance effort is ongoing for the current amenities and ongoing cost estimates are not expected to increase significantly above the current level.

NO PRIOR YEAR FUNDING

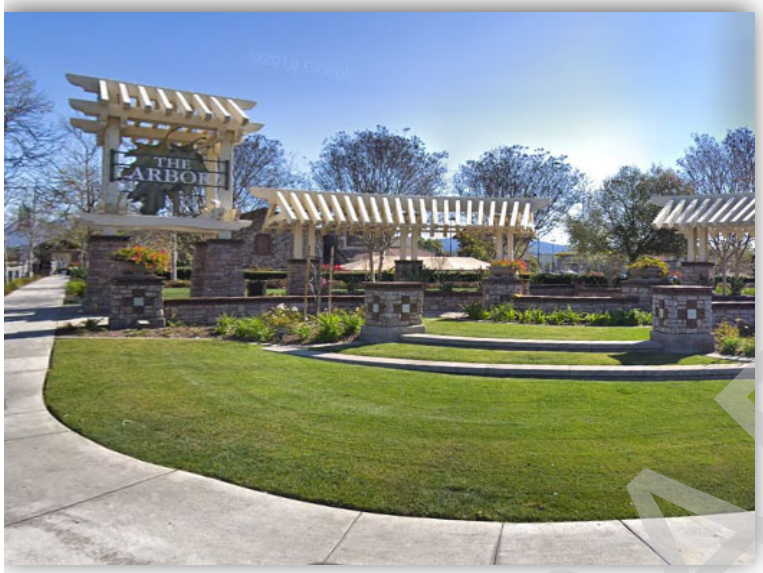
CURRENT AND FUTURE FUNDING

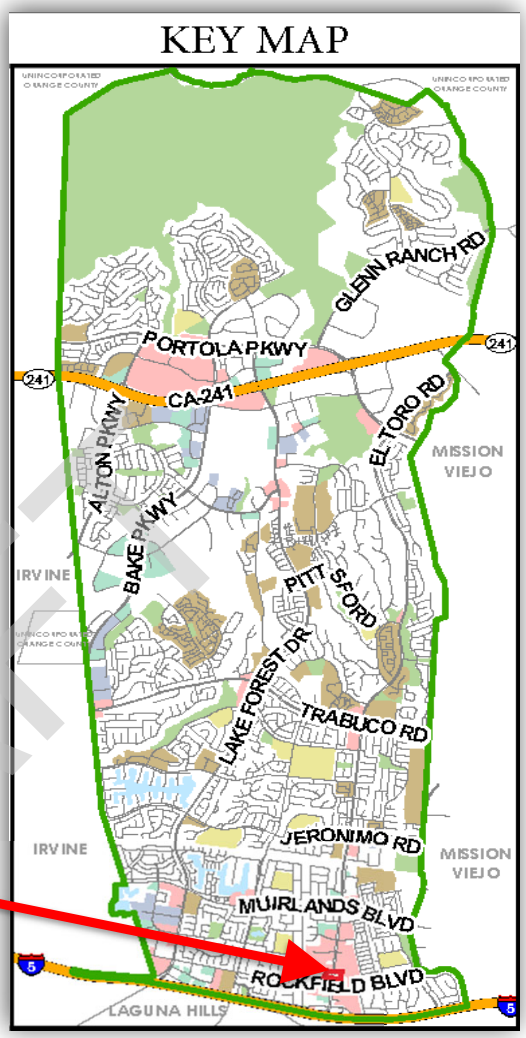
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 20,000	$ 10,000				$ 30,000
Total Estimate	**$ 20,000**	**$ 10,000**	**$ -**	**$ -**	**$ -**	**$ 30,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 20,000	$ 10,000				$ 30,000
						$ -
						$ -
Total Revenue	**$ 20,000**	**$ 10,000**	**$ -**	**$ -**	**$ -**	**$ 30,000**

DRAFT

PROGRAM NUMBER/NAME: PW# / The Arbor Parkway Repairs
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks & Recreation Improvements





Project Location

DRAFT

PROGRAM DESCRIPTION:
This project would repair the existing landscaping at the Arbors, a large section of landscaped parkway along El Toro Road, including both easterly corners of El Toro Road and Rockfield Blvd. The Arbors was constructed in 2006. Since that time the City has maintained the landscaping/hardscape in this area, however, due to the age and condition of the facilities, repairs are warranted. The project would repair/repaint the hardscape amenities (electrical, lighting, structures, bus shelters) and provide temporary fencing during the repair/renovation process.

PURPOSE:
Strategic Plan Goal: A Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: 2 Attractive
Strategic Plan Strategy: a Proactively enhance the visual character of the City and plan for
The purpose of this project is to improve the visual character of the Arbors.

PROGRAM NUMBER/NAME: PW# / The Arbor Parkway Repairs
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks & Recreation Improvements

ESTIMATED ANNUAL COST IMPACT OF PROGRAM ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets.

NO PRIOR YEAR FUNDING

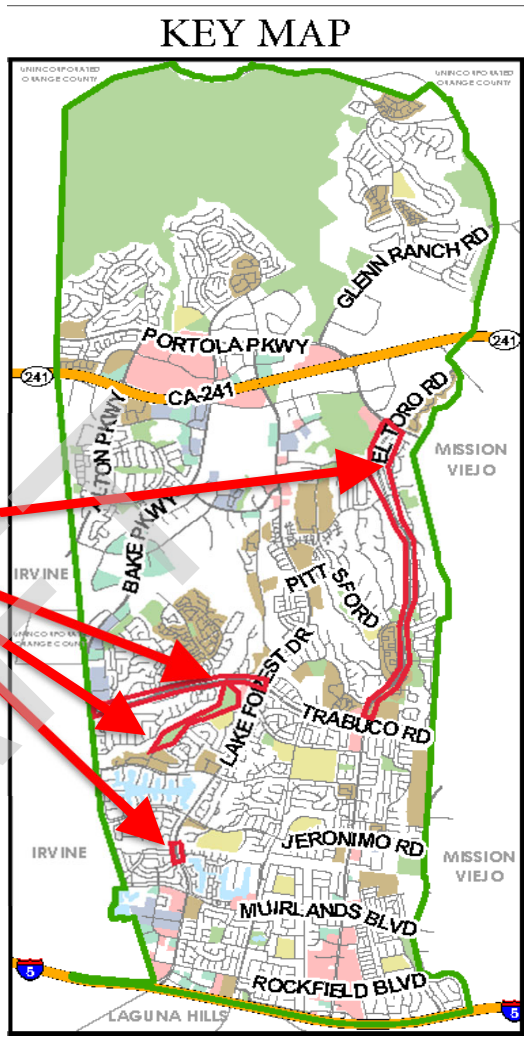
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 95,000					$ 95,000
Total Estimate	**$ 95,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 95,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 95,000					$ 95,000
						$ -
						$ -
Total Revenue	**$ 95,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 95,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Urban Forestry Management
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



Project Locations

DRAFT

PROJECT DESCRIPTION:
This project would remove dead Eucalyptus trees from the Serrano Creek Forest. Over the years drought and insects have severely affected the condition of trees. The thinning of the forest would provide a healthy environment for the remaining trees. This project would also plant new trees in Serrano Park and other parts of the community. The project would remove 207 dead Eucalyptus trees. The project would add 75 parkway trees along Trabuco between Bake and Lake Forest Drive, 200 parkway trees on El Toro Road between Portola and Trabuco and 75 slope trees on Overlake slope between Muirlands and Jeronimo.

PROJECT NUMBER/NAME: PW# / Urban Forestry Management
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The removal of the dead or dying trees and replacement of damaged trees would improve the City's urban forest.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget.

NO PRIOR YEAR FUNDING

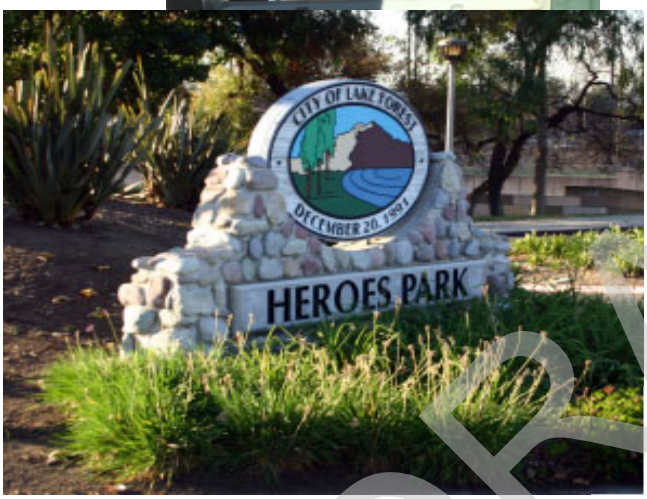
CURRENT AND FUTURE FUNDING

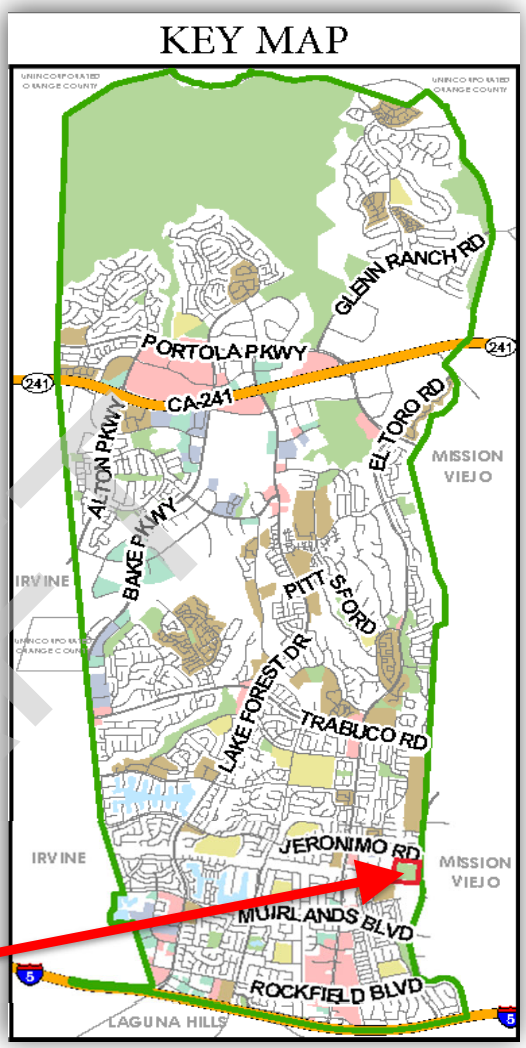
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 205,000					$ 205,000
Total Estimate	**$ 205,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 205,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 205,000					$ 205,000
						$ -
						$ -
Total Revenue	**$ 205,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 205,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Heroes Park Irrigation Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation





Project Location

DRAFT

PROJECT DESCRIPTION:
This project would replace the current irrigation infrastructure at the park. The irrigation system at this park has been changed and modified many times over the decades and is no longer effective at watering all portions of the park. The existing irrigation system creates excessively dry and wet areas, making play difficult impacting the maintenance of the fields. As part of these improvements, an aged irrigation pump that has lasted beyond its current lifespan would also be replaced.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The project would make repairs to existing park facilities and replace amenities.

PROJECT NUMBER/NAME: PW# / Heroes Park Irrigation Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 110,000					$ 110,000
Total Estimate	**$ 110,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 110,000**

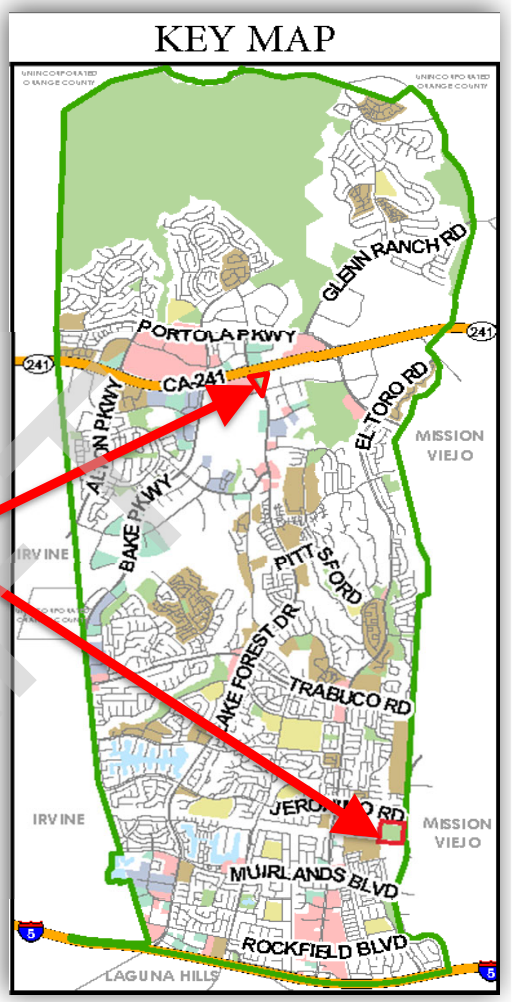
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 110,000					$ 110,000
						$ -
						$ -
Total Revenue	**$ 110,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 110,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Heroes Park & Etnies Park Musco LED Light Replacements

RESPONSIBLE DEPARTMENT: Maintenance

CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:

This project would study the benefits of replacing the existing MUSCO lights at Etnies and Heroes Parks with LED Sports Lighting, and in a future CIP cycle replace the existing lighting, if warranted by the study. The current lighting at the parks can burn out quickly and is affected by heavy wind events. This requires the City's electrical contractor to rent a very large boom truck and replace bulbs in large quantities. An energy efficiency study, along with a luminescence study and measurement, would be made to project the project payback, ensure the visibility and appropriate light type and voltage is provided. Etnies Estimate ($245,000) Heroes Estimate ($450,000)

PROJECT NUMBER/NAME: PW# / Heroes Park & Etnies Park Musco LED Light Replacements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

This project would upgrade the Musco Sports Lights with LED bulbs to reduce maintenance and energy costs. LED lighting provides improved coverage and lasts longer than the metal halide lights currently used.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets. This project also provides a reduction in energy costs from conversion to LED lighting.

NO PRIOR YEAR FUNDING

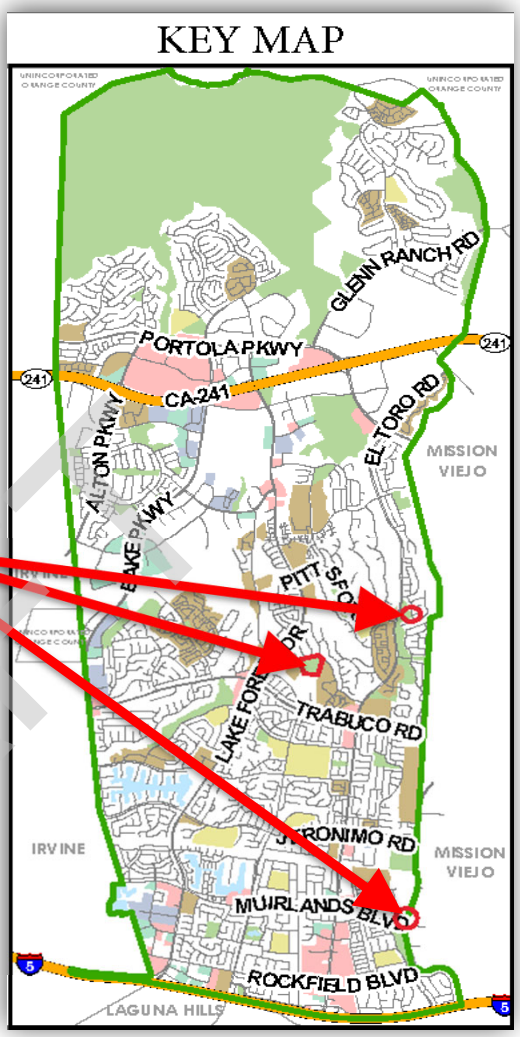
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction		$ 30,000	$ 245,000	$ 450,000		$ 725,000
Total Estimate	**$ -**	**$ 30,000**	**$ 245,000**	**$ 450,000**	**$ -**	**$ 725,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ -	$ 30,000	$ 245,000	$ 450,000		$ 725,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 30,000**	**$ 245,000**	**$ 450,000**	**$ -**	**$ 725,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Park Name Sign Medallion Replacements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
This project would remove and replace park monument signs at Rimgate, Sundowner and El Toro Park at the entrance on the corner of Muirlands and Los Alisos. The City seal medallions on the park name signs are beyond maintenance. The medallion materials have eroded away and can no longer be repaired.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.
The project would replace deteriorated park sign medallions improving the attractiveness of the park for residents and visitors.

PROJECT NUMBER/NAME: PW# / Park Name Sign Medallion Replacements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget.

NO PRIOR YEAR FUNDING

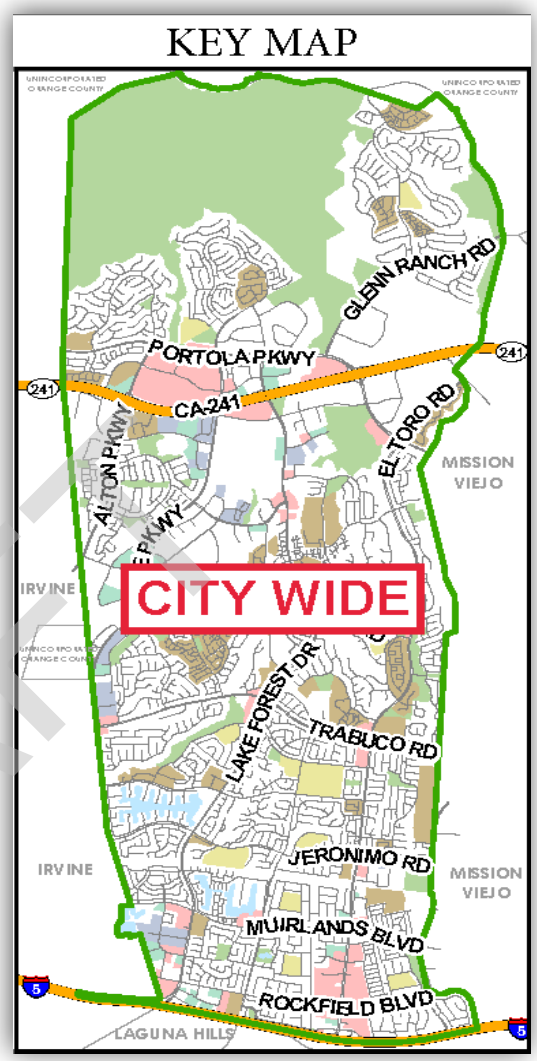
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 25,000					$ 25,000
Total Estimate	**$ 25,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 25,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 25,000					$ 25,000
						$ -
						$ -
Total Revenue	**$ 25,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 25,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Park Restroom Timers Installation
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
This project would improve exterior lighting and install atomic clocks at each of the park restrooms. The restrooms currently require all restrooms to be locked by automatic timers that must be adjusted frequently when time changes and sunrises and sunsets change. The improved exterior lighting would make it easier to see anyone vandalizing the restrooms after hours.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The project would help park staff with maintaining the park restrooms in an efficient manner, as the atomic clocks would work with the various sunsets and sunrises to adjust automatically creating a safer park for residents.

PROJECT NUMBER/NAME: PW# / Park Restroom Timers Installation
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget.

NO PRIOR YEAR FUNDING

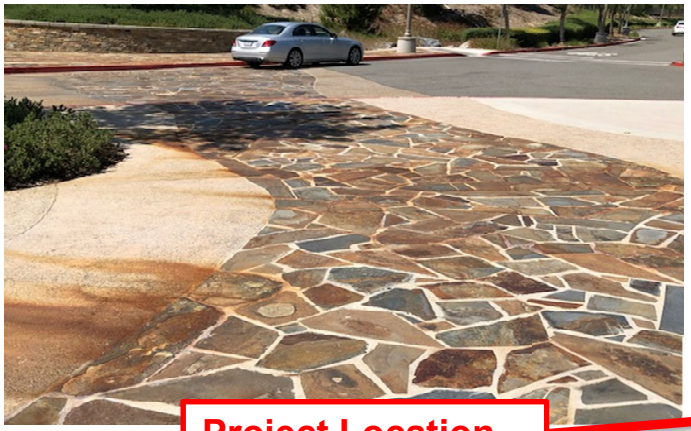
CURRENT AND FUTURE FUNDING

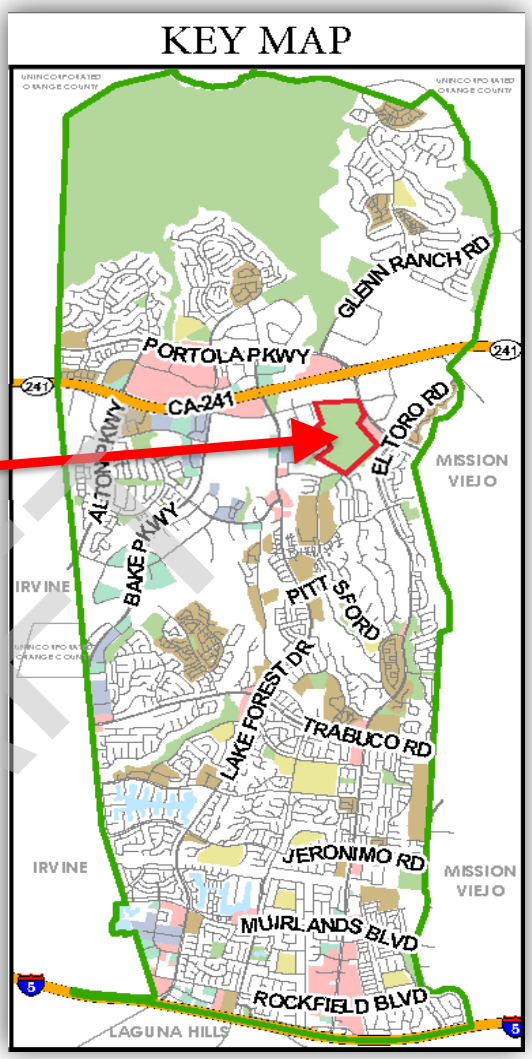
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 25,000					$ 25,000
Total Estimate	**$ 25,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 25,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 25,000					$ 25,000
						$ -
						$ -
Total Revenue	**$ 25,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 25,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Sports Complex Paver Replacement Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation





PROJECT DESCRIPTION:
This project would replace the pavers at the entrance to the Sports Park. The original pavers at both sides of the park have become dislodged and stained surrounding sidewalks. This project would analyze and install the best material for the entrances to the park.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The project would replace the damaged pavers in the Sports Complex.

PROJECT NUMBER/NAME: PW# / Sports Complex Paver Replacement Project
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget.

NO PRIOR YEAR FUNDING

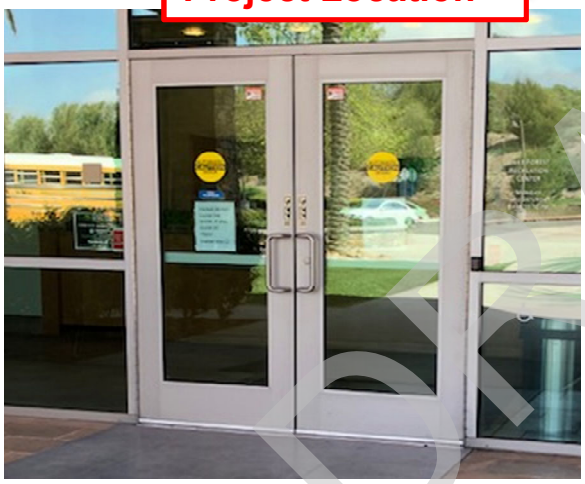
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction		$ 50,000				$ 50,000
Total Estimate	**$ -**	**$ 50,000**	**$ -**	**$ -**	**$ -**	**$ 50,000**

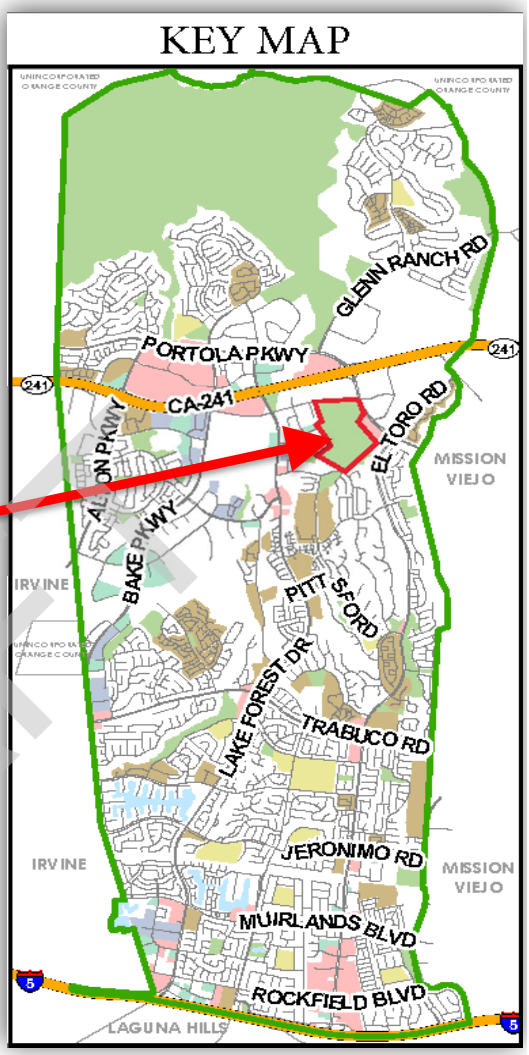
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ -	$ 50,000				$ 50,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 50,000**	**$ -**	**$ -**	**$ -**	**$ 50,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Recreation Center Sliding Doors Installation
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



Project Location



DRAFT

PROJECT DESCRIPTION:
This project would replace the existing front and rear doors at the sports complex recreation center with automated sliding doors. The existing swinging doors not designed to handle the amount of usage the doors receive, causing significant wear on the motor that opens the automatic door. In addition, people try to force the automatic doors closed causing increased wear on internal parts, requiring numerous call outs for adjustments. The project would install automatic sliding doors, better equipped to handle the heavy use of the Recreation Center.

PROJECT NUMBER/NAME: PW# / Recreation Center Sliding Doors Installation
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The replacement of the doors would help staff maintain the recreation center by reducing the need for frequent repairs of the doors.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget.

NO PRIOR YEAR FUNDING

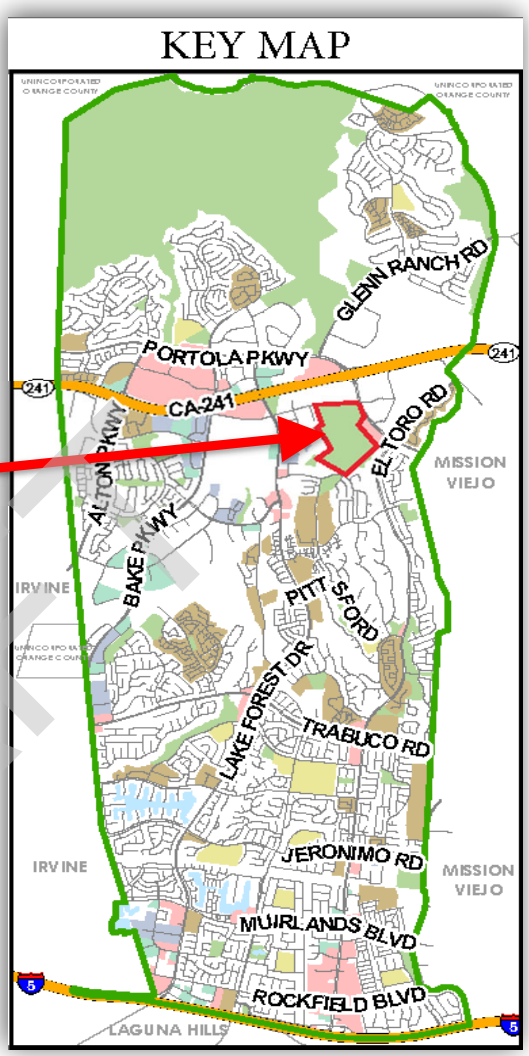
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 40,000					$ 40,000
Total Estimate	**$ 40,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 40,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 40,000					$ 40,000
						$ -
						$ -
Total Revenue	**$ 40,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 40,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Sports Park Complex Painting
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
This project would repaint the benches and tables located on the Sports Park property. As a result of weather, numerous benches, chairs and tables have begun to show premature wear and rusting. Without new paint the seating with be compromised and require complete replacement. Repainting these amenities would protect and extend their useful. This project would repaint 88 amenities.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.
The project would repaint the damaged benches and tables at the Sports Park.

PROJECT NUMBER/NAME: PW# / Sports Park Complex Painting
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the assets. Recurring painting is necessary to proactively maintain the assets properly.

NO PRIOR YEAR FUNDING

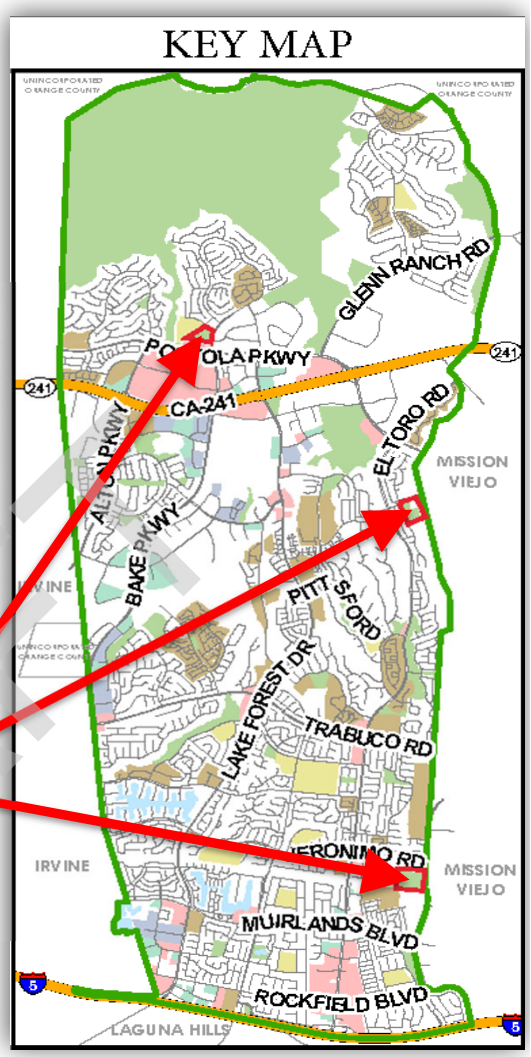
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 36,000					$ 36,000
Total Estimate	**$ 36,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 36,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 36,000					$ 36,000
						$ -
						$ -
Total Revenue	**$ 36,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 36,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Calsense Controllers
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation



Project Locations

DRAFT

PROJECT DESCRIPTION:
This project would update hardware and software necessary to run the existing Calsense Irrigation infrastructure utilized in several city parks. The existing irrigations systems in these parks cannot be operated digitally and must be operated manually due to the Calsense controllers no longer function on outdated software. Calsense controllers automatically shuts off for weather events thus saving water and maintenance time. With the new upgraded communications devices, staff would be able to monitor the whole city at one time, online, using cloud based software. This system would also allow reports on water usage for better management and alert staff when things break and what needs to be fixed.

PROJECT NUMBER/NAME: PW# / Calsense Controllers
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The project would maintain the park irrigation systems in an efficient manner and continue to keep the parks attractive and well maintained.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget. Updates to the software technology would be needed in 5 years.

NO PRIOR YEAR FUNDING

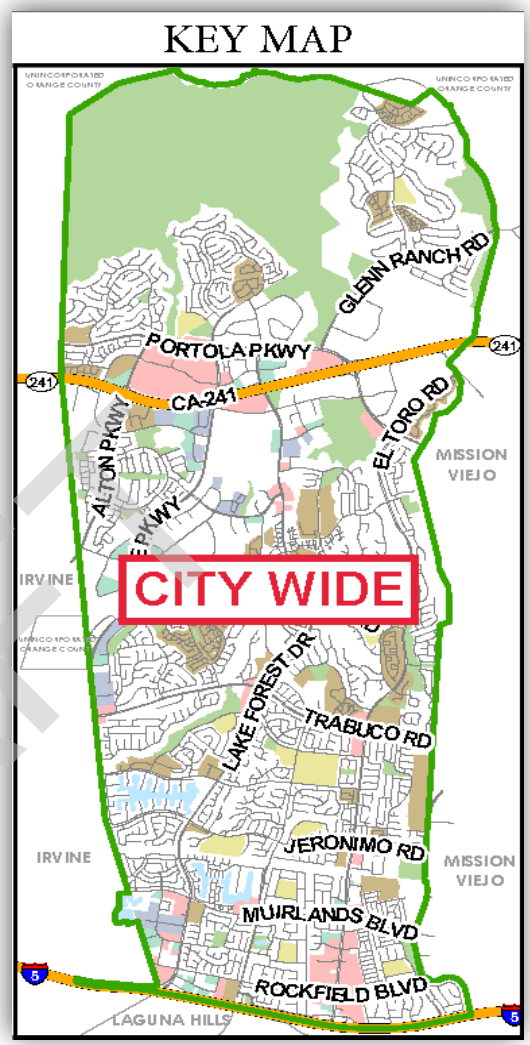
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 45,000					$ 45,000
Total Estimate	**$ 45,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 45,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 45,000					$ 45,000
						$ -
						$ -
Total Revenue	**$ 45,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 45,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Park Parking Lot Resurfacing
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Parks and Recreation



DRAFT

PROJECT DESCRIPTION:
This project would perform repairs to the asphalt and slurry seal the parking lots at various parks throughout the City. The parks included for this project are Concourse Park, Borrego Park, Foothill Ranch Park, Etnies Skatepark, Heroes Park, Rancho Serrano Park, Tamarisk Park, and Darrin Park.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.
Maintaining a "Good" Pavement Condition Index helps to sustain the quality of the pavement in the parking lots.

PROJECT NUMBER/NAME: PW# / Park Parking Lot Resurfacing
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project would provide preventive maintenance and/or rehabilitation, which would reduce annual maintenance costs over the life of the pavement by an estimated average of 30% (Source: American Public Works Association). Recurring resurfacing also reduces risk management costs.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

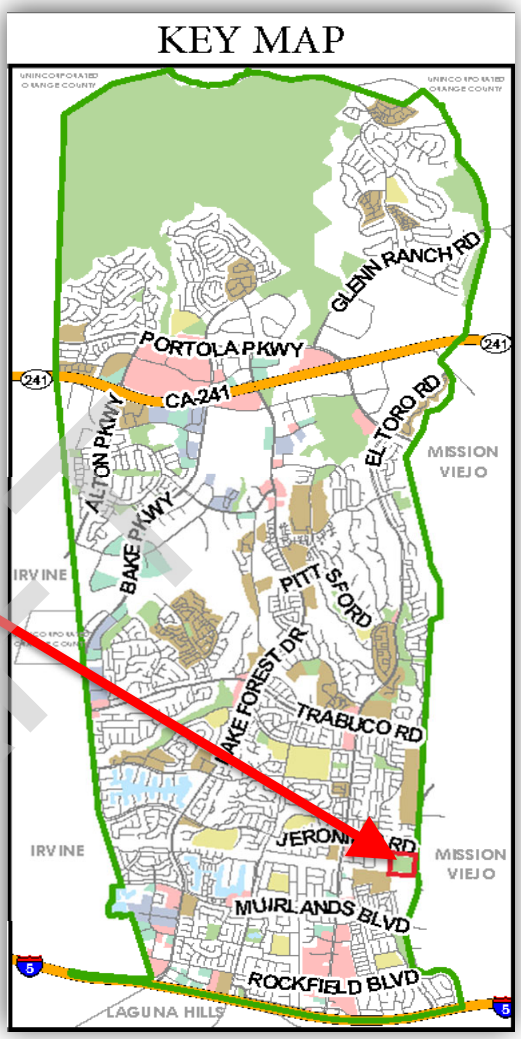
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction		$ 120,000				$ 120,000
Total Estimate	**$ -**	**$ 120,000**	**$ -**	**$ -**	**$ -**	**$ 120,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)		$ 120,000				$ 120,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 120,000**	**$ -**	**$ -**	**$ -**	**$ 120,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Heroes Park Security Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

Project Location



DRAFT

PROJECT DESCRIPTION:
This project would install security cameras to help deter vandalism that occurs at the park. Cameras would be placed to capture images of cars entering and exiting the park as well as views of the restrooms and concessions building, which has had frequent instances of vandalism.

PURPOSE:
Strategic Plan Goal: Our livable city is well planned, attractive and safe
Strategic Plan Priority Area: Attractive
Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The installation of security cameras in Heroes park would deter vandalism in the park.

PROJECT NUMBER/NAME: PW# / Heroes Park Security Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
There is an anticipated annual increase of $10,000 for security camera maintenance, monitoring and equipment replacement to the General Fund.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

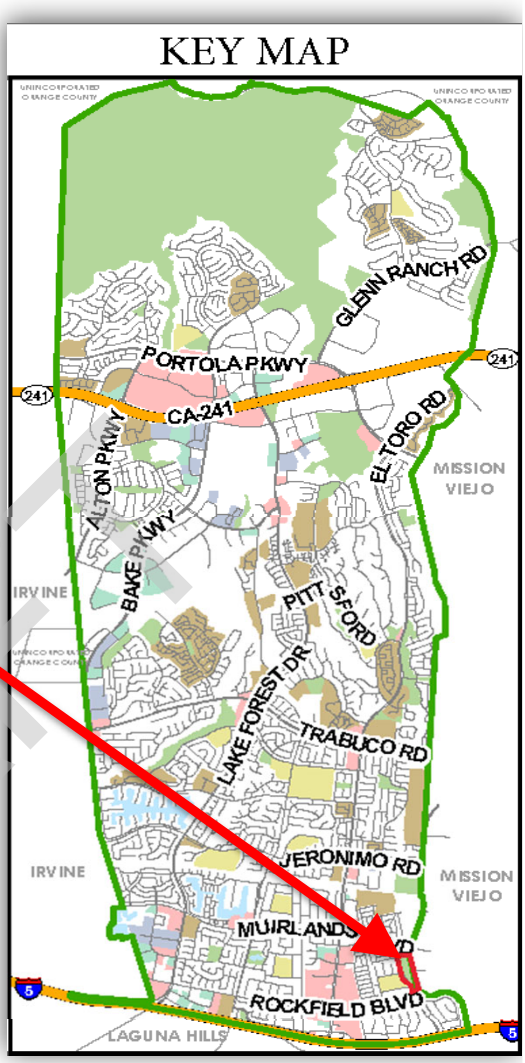
PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 70,000					$ 70,000
Total Estimate	**$ 70,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 70,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ 70,000					$ 70,000
						$ -
						$ -
Total Revenue	**$ 70,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 70,000**

DRAFT

PROJECT NUMBER/NAME: PW# / El Toro Park Security Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

Project Location



DRAFT

PROJECT DESCRIPTION:
This project would install security cameras to help deter vandalism that occurs at the park. Cameras would be placed to capture views of the restrooms and tennis courts, which have had frequent instances of vandalism.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The installation of security cameras in El Toro park would deter vandalism in the park.

PROJECT NUMBER/NAME: PW# / El Toro Park Security Improvements
RESPONSIBLE DEPARTMENT: Maintenance
CATEGORY: Parks and Recreation

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
There is an anticipated annual increase of $10,000 for security camera maintenance, monitoring and equipment replacement to the General Fund.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction		$ 70,000				$ 70,000
Total Estimate	**$ -**	**$ 70,000**	**$ -**	**$ -**	**$ -**	**$ 70,000**

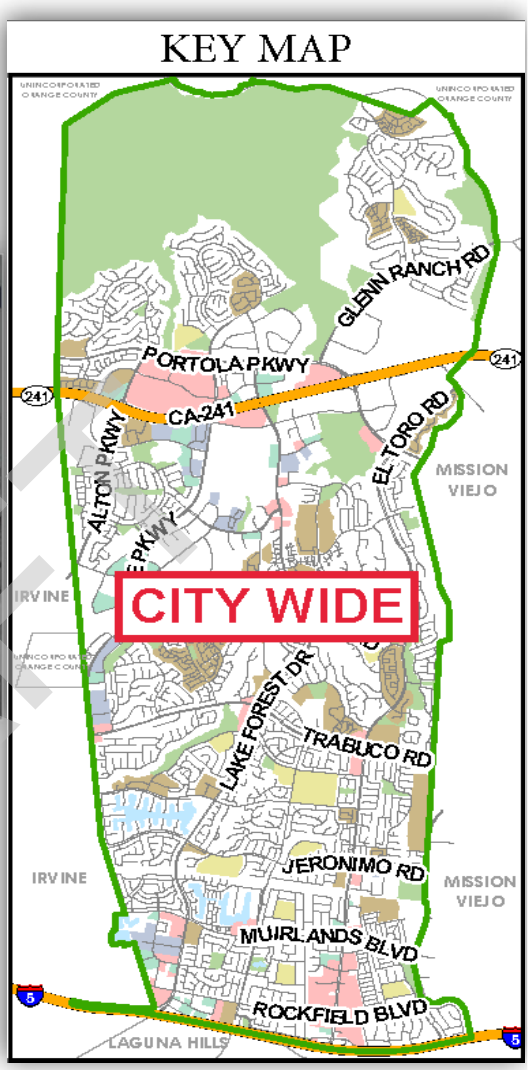
Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
CIP (120)	$ -	$ 70,000				$ 70,000
						$ -
						$ -
Total Revenue	**$ -**	**$ 70,000**	**$ -**	**$ -**	**$ -**	**$ 70,000**

DRAFT

PROJECT NUMBER/NAME: PW# / Catch Basin Best Management Practices Environmental Tier 1 Improvements

RESPONSIBLE DEPARTMENT: Water Quality/NPDES

CATEGORY: Environmental



DRAFT

PROJECT DESCRIPTION:

This project would install catch basin Best Management Practices ("BMP") citywide. This project would be the 8th and 9th phases for catch basin retrofits under the OCTA grant program for the Environmental Tier 1 Improvements Program. This project addresses requirements mandated by a pending statewide trash policy under development by the State Water Resources Control Board. There are 1,006 catch basins citywide. To-date the City has installed 666 debris screens.

PROJECT NUMBER/NAME: PW# / Catch Basin Best Management Practices Environmental Tier 1 Improvements

RESPONSIBLE DEPARTMENT: Water Quality/NPDES

CATEGORY: Environmental

PURPOSE:

Strategic Plan Goal: Our livable city is well planned, attractive and safe

Strategic Plan Priority Area: Attractive

Strategic Plan Strategy: Proactively enhance the visual character of the City and plan for maintenance of all City assets.

The project would help prevent pollutants from entering the drainage system and allow the debris to be more easily collected during street sweeping, helping to maintain an attractive city and prevent pollutants generated and transported at street level from entering the storm drain system that affects downstream water bodies.

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget.

NO PRIOR YEAR FUNDING

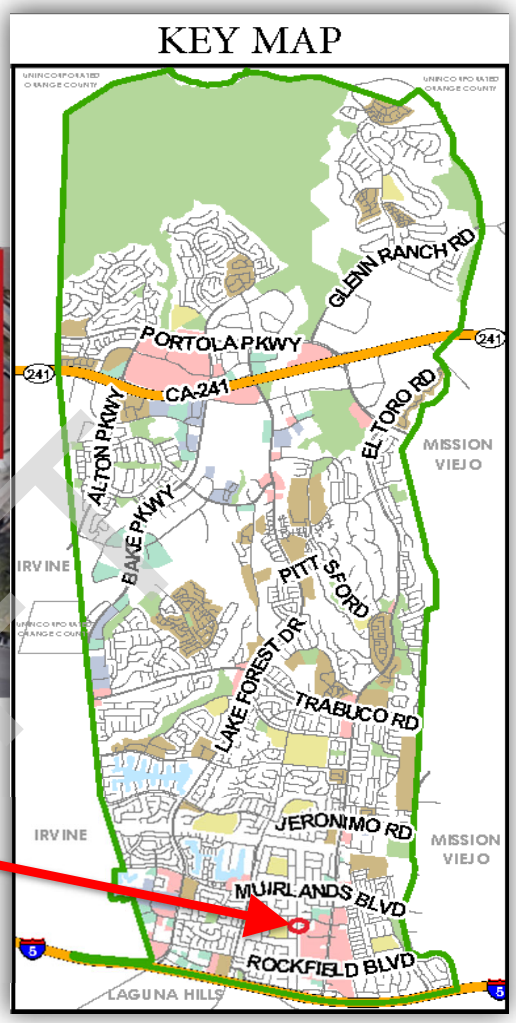
CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design						$ -
Construction	$ 133,500	$ 133,500	$ 133,500	$ 133,500	$ 133,500	$ 667,500
Total Estimate	**$ 133,500**	**$ 133,500**	**$ 133,500**	**$ 133,500**	**$ 133,500**	**$ 667,500**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
M2 CTFP (223)	$ 100,125	$ 100,125	$ 100,125	$ 100,125	$ 100,125	$ 500,625
CIP (120)	$ 33,375	$ 33,375	$ 33,375	$ 33,375	$ 33,375	$ 166,875
						$ -
Total Revenue	**$ 133,500**	**$ 133,500**	**$ 133,500**	**$ 133,500**	**$ 133,500**	**$ 667,500**

DRAFT

PROJECT NUMBER/NAME: PW# / Packer Place Storm Drain Improvements
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Environmental



Project Location

DRAFT

PROJECT DESCRIPTION:
This project would design and construct a new drainage system near Packer Place where a small park is located. The current drainage system is inadequate to handle water flow from instances of the average rain event. This project would improve the design and capacity of the drainage system providing for appropriate water flow reducing instances of standing water impacting the street.

PURPOSE:

Strategic Plan Goal:	Our livable city is well planned, attractive and safe
Strategic Plan Priority Area:	Attractive
Strategic Plan Strategy:	Proactively ehannce the visual character of the City and plan for maintenance of all City assets.

The project would construct a well planned drainage system, maintaining the attractiveness of the pocket park and improving safety by mitigating the flooding in the cul-de-sac of Packer Place.

PROJECT NUMBER/NAME: PW# / Packer Place Storm Drain Improvements
RESPONSIBLE DEPARTMENT: Engineering
CATEGORY: Environmental

ESTIMATED ANNUAL COST IMPACT OF PROJECT ON CITY OPERATING BUDGET:
This project is expected to have an insignificant impact on the operating budget.

NO PRIOR YEAR FUNDING

CURRENT AND FUTURE FUNDING

PROJECT ESTIMATE	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Land						$ -
Planning/Design	$ 7,500					$ 7,500
Construction		$ 67,500				$ 67,500
Total Estimate	**$ 7,500**	**$ 67,500**	**$ -**	**$ -**	**$ -**	**$ 75,000**

Funding Source	FY 2019/20	FY 2020/21	FY 2021/22	FY 2022/23	FY 2023/24	TOTAL
Gas Tax HUTA (210)	$ 7,500	$ 67,500				$ 75,000
						$ -
						$ -
Total Revenue	**$ 7,500**	**$ 67,500**	**$ -**	**$ -**	**$ -**	**$ 75,000**

DRAFT

Appendix 4: Cumulative (2040) Plus Plan Intersection Level of Service Worksheets

Lake Forest GPU (Constrained AM)

Vistro File: H:\...\2040_Constrained_AM.vistro
Report File: H:\...\Constrained_AM_LOS.pdf

Scenario: Base Scenario
10/7/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1		Signalized	ICU 1	NWB Left	0.478	-	A
2		Signalized	ICU 1	SWB Left	0.478	-	A
3		Signalized	ICU 1	NWB Thru	0.561	-	A
4		Signalized	ICU 1	NB Thru	0.548	-	A
5		Signalized	ICU 1	NEB Thru	0.661	-	B
6		Signalized	ICU 1	NEB Left	0.673	-	B
7		Signalized	ICU 1	NB Thru	0.394	-	A
8		Signalized	ICU 1	NB Thru	0.465	-	A
9		Signalized	ICU 1	SWB Thru	0.629	-	B
10		Signalized	ICU 1	NWB Thru	0.726	-	C
11		Signalized	ICU 1	SWB Thru	0.964	-	E
12		Signalized	ICU 1	NB Thru	0.642	-	B
13		Signalized	ICU 1	WB Thru	0.779	-	C
14		Signalized	ICU 1	NEB Thru	0.738	-	C
15		Signalized	ICU 1	SWB Thru	0.714	-	C
16		Signalized	ICU 1	NWB Thru	0.599	-	A
17		Signalized	ICU 1	SWB Thru	0.681	-	B
18		Signalized	ICU 1	NEB Thru	0.865	-	D
19		Signalized	ICU 1	SWB Thru	0.658	-	B
20		Signalized	ICU 1	SWB Thru	0.601	-	B
21		Signalized	ICU 1	SWB Thru	0.576	-	A
22		Signalized	ICU 1	NEB Thru	0.925	-	E
23		Signalized	ICU 1	WB Thru	0.685	-	B
24		Signalized	ICU 1	NWB Thru	0.556	-	A
25		Signalized	ICU 1	SWB Thru	0.691	-	B
26		Signalized	ICU 1	SWB Thru	0.781	-	C
27		Signalized	ICU 1	SWB Thru	0.586	-	A
28		Signalized	ICU 1	NWB Thru	0.494	-	A
29		Signalized	ICU 1	SWB Thru	0.742	-	C
30		Signalized	ICU 1	SWB Thru	0.656	-	B
31		Signalized	ICU 1	SWB Thru	0.687	-	B
32		Signalized	ICU 1	SEB Thru	0.450	-	A
33		Signalized	ICU 1	SWB Thru	0.816	-	D
34		Signalized	ICU 1	SWB Thru	0.663	-	B
35		Signalized	ICU 1	EB Thru	0.518	-	A

36		Signalized	ICU 1	WB Thru	0.645	-	B
37		Signalized	ICU 1	SWB Thru	0.606	-	B
38		Signalized	ICU 1	SWB Thru	0.781	-	C
39		Signalized	ICU 1	SWB Thru	0.472	-	A
40		Signalized	ICU 1	NB Thru	0.650	-	B
41		Signalized	ICU 1	SWB Thru	0.607	-	B
42		Signalized	ICU 1	SWB Thru	0.667	-	B
51		Signalized	ICU 1	SWB Right	0.443	-	A
56		Signalized	ICU 1	SWB Thru	0.811	-	D
57		Signalized	ICU 1	NEB Left	0.576	-	A
60		Signalized	ICU 1	NWB Thru	0.590	-	A
101		Signalized	ICU 1	SWB Thru	0.650	-	B
102		Signalized	ICU 1	SWB Thru	0.490	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.478

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	100.00	150.00	100.00	55.00	315.00	100.00	245.00	170.00	100.00	585.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	130	30	480	240	280	20	520	260	140	20	380	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.31	3.33	2.08	2.08	2.14	0.00	1.92	1.92	2.14	0.00	2.11	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	30	120	240	280	5	520	260	35	20	380	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	8	30	60	70	1	130	65	9	5	95	12
Total Analysis Volume [veh/h]	130	30	120	240	280	5	520	260	35	20	380	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Permis	Protect	Permis	Unsign	Protect	Permis	Unsign
Signal Group	7	4	0	3	8	8	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.14	0.08	0.00	0.15	0.05	0.00	0.01	0.11	0.00
Intersection LOS	A											
Intersection V/C	0.478											

Intersection Level Of Service Report
Intersection 2:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.478

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	190.00	100.00	180.00	285.00	100.00	285.00	230.00	100.00	100.00	230.00	100.00	220.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	130	210	300	260	390	190	480	330	140	360	370	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.31	1.90	2.00	1.92	2.05	2.11	2.08	2.12	2.14	1.94	1.89	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	210	75	260	390	47	480	330	140	360	370	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	53	19	65	98	12	120	83	35	90	93	9
Total Analysis Volume [veh/h]	130	210	75	260	390	47	480	330	140	360	370	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.06	0.04	0.15	0.11	0.03	0.14	0.09	0.09	0.11	0.07	0.02
Intersection LOS	A											
Intersection V/C	0.478											

Intersection Level Of Service Report
Intersection 3:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.561

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	195.00	100.00	295.00	110.00	100.00	425.00	300.00	100.00	100.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	120	220	250	200	390	20	600	860	240	30	760	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	1.82	2.00	2.00	2.05	0.00	2.00	1.98	2.08	3.33	1.97	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	220	62	200	390	5	600	860	240	30	760	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	55	16	50	98	1	150	215	60	8	190	13
Total Analysis Volume [veh/h]	120	220	62	200	390	5	600	860	240	30	760	52
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.06	0.04	0.12	0.11	0.00	0.18	0.22	0.22	0.01	0.15	0.03
Intersection LOS	A											
Intersection V/C	0.561											

Intersection Level Of Service Report
Intersection 4:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.548

Intersection Setup

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Approach	Northbound			Westbound			Northeastbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left2	Left	Thru	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	0	0	0	2	0	1
Pocket Length [ft]	200.00	100.00	100.00	215.00	100.00	345.00	100.00	100.00	100.00	515.00	100.00	185.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Base Volume Input [veh/h]	240	1250	700	710	120	870	90	50	120	220	840	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.08	2.00	2.00	1.97	1.67	1.95	2.22	2.00	1.67	1.82	2.02	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	240	1250	175	710	120	870	90	50	120	220	840	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	313	44	178	30	218	23	13	30	55	210	8
Total Analysis Volume [veh/h]	240	1250	175	710	120	870	90	50	120	220	840	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Protect	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	1	1	6	0	5	2	2	7	4	4
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	Lag	-	Lead	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.25	0.00	0.21	0.04	0.00	0.05	0.05	0.05	0.06	0.16	0.02
Intersection LOS	A											
Intersection V/C	0.548											

Intersection Level Of Service Report
Intersection 5:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	0	0	2	0	0	1
Pocket Length [ft]	535.00	100.00	300.00	620.00	100.00	70.00	100.00	100.00	555.00	100.00	100.00	730.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	210	1060	390	430	1470	60	200	0	430	340	0	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.90	1.98	2.05	2.09	1.97	1.67	2.00	0.00	2.09	2.06	0.00	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	210	1060	97	430	1470	15	200	0	107	340	0	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	265	24	108	368	4	50	0	27	85	0	7
Total Analysis Volume [veh/h]	210	1060	97	430	1470	15	200	0	107	340	0	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	212
Lost time [s]	11.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.21	0.00	0.13	0.29	0.00	0.06	0.00	0.00	0.20	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.661											

Intersection Level Of Service Report
Intersection 6:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.673

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	2	1	0	1
Pocket Length [ft]	170.00	100.00	100.00	370.00	100.00	100.00	100.00	100.00	435.00	550.00	100.00	550.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	380	540	140	50	1100	840	150	0	100	460	0	760
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.11	2.04	2.14	2.00	2.00	2.02	2.00	0.00	2.00	1.96	0.00	1.97
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	380	540	35	50	1100	210	150	0	25	460	0	190
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	135	9	13	275	53	38	0	6	115	0	48
Total Analysis Volume [veh/h]	380	540	35	50	1100	210	150	0	25	460	0	190
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.11	0.00	0.03	0.22	0.00	0.04	0.00	0.00	0.14	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.673											

Intersection Level Of Service Report
Intersection 7:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.394

Intersection Setup

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Approach	Northbound		Eastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Left	Right	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	1
Pocket Length [ft]	355.00	100.00	100.00	100.00	100.00	395.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Base Volume Input [veh/h]	150	1170	0	0	860	630
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.97	0.00	0.00	1.98	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	1170	0	0	860	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	293	0	0	215	39
Total Analysis Volume [veh/h]	150	1170	0	0	860	157
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	0	0	6	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.34	0.00	0.00	0.25	0.09
Intersection LOS	A					
Intersection V/C	0.394					

Intersection Level Of Service Report
Intersection 8:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.465

Intersection Setup

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Approach	Northbound		Southbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	655.00	365.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Base Volume Input [veh/h]	0	1010	930	0	400	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.98	2.04	0.00	2.00	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1010	930	0	400	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	253	233	0	100	11
Total Analysis Volume [veh/h]	0	1010	930	0	400	42
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	0	2	6	0	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.30	0.27	0.00	0.12	0.02
Intersection LOS	A					
Intersection V/C	0.465					

Intersection Level Of Service Report
Intersection 9:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	1
Pocket Length [ft]	100.00	230.00	390.00	100.00	185.00	145.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Base Volume Input [veh/h]	750	310	200	1050	820	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.94	2.00	2.00	1.95	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	750	77	200	1050	820	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	188	19	50	263	205	12
Total Analysis Volume [veh/h]	750	77	200	1050	820	47
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.05	0.12	0.31	0.24	0.01
Intersection LOS	B					
Intersection V/C	0.629					

Intersection Level Of Service Report
Intersection 10:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.726

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	340.00	100.00	200.00	250.00	100.00	110.00	245.00	100.00	215.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Base Volume Input [veh/h]	260	710	150	70	720	260	280	900	150	80	280	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	1.97	2.00	1.43	1.94	1.92	2.14	2.00	2.00	2.50	2.14	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	710	37	70	720	65	280	900	37	80	280	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	178	9	18	180	16	70	225	9	20	70	3
Total Analysis Volume [veh/h]	260	710	37	70	720	65	280	900	37	80	280	12
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.21	0.02	0.04	0.21	0.04	0.08	0.26	0.02	0.05	0.08	0.01
Intersection LOS	C											
Intersection V/C	0.726											

Intersection Level Of Service Report
Intersection 11:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.964

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	190.00	100.00	190.00	190.00	100.00	80.00	100.00	100.00	100.00	190.00	100.00	180.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Base Volume Input [veh/h]	460	890	390	170	1430	410	70	70	50	140	350	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	2.02	2.05	1.76	2.03	1.95	1.43	1.43	2.00	2.14	2.00	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	890	97	170	1430	102	70	70	50	140	350	340
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	223	24	43	358	26	18	18	13	35	88	85
Total Analysis Volume [veh/h]	460	890	97	170	1430	102	70	70	50	140	350	340
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.27	0.26	0.06	0.10	0.42	0.06	0.02	0.04	0.04	0.04	0.20	0.20
Intersection LOS	E											
Intersection V/C	0.964											

Intersection Level Of Service Report
Intersection 12:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	1	0	2
Pocket Length [ft]	400.00	100.00	100.00	200.00	100.00	100.00	395.00	100.00	260.00	150.00	100.00	170.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Base Volume Input [veh/h]	410	1990	30	150	1010	320	420	210	440	20	650	570
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.95	2.01	3.33	2.00	1.98	1.88	1.90	1.90	2.05	0.00	2.00	1.93
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	410	1990	30	150	1010	80	420	210	110	20	650	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	103	498	8	38	253	20	105	53	28	5	163	36
Total Analysis Volume [veh/h]	410	1990	30	150	1010	80	420	210	110	20	650	142
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.30	0.30	0.04	0.20	0.05	0.12	0.04	0.06	0.01	0.13	0.04
Intersection LOS	B											
Intersection V/C	0.642											

Intersection Level Of Service Report
Intersection 13:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Thru	Right	Right2	Left2	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	0
Pocket Length [ft]	285.00	100.00	180.00	285.00	100.00	220.00	345.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Base Volume Input [veh/h]	30	1370	150	240	1140	650	380	230	20	160	360	270
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	1.97	2.00	2.08	2.02	2.00	2.11	2.17	0.00	1.88	1.94	1.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	1370	20	240	1140	162	380	230	20	160	360	270
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	343	5	60	285	41	95	58	5	40	90	68
Total Analysis Volume [veh/h]	30	1370	20	240	1140	162	380	230	20	160	360	270
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Permis	Protect	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.40	0.01	0.14	0.34	0.10	0.11	0.15	0.15	0.09	0.11	0.19
Intersection LOS	C											
Intersection V/C	0.779											

Intersection Level Of Service Report
Intersection 14:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.738

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	2	2	0	1
Pocket Length [ft]	305.00	100.00	155.00	305.00	100.00	150.00	305.00	100.00	225.00	275.00	100.00	275.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Base Volume Input [veh/h]	150	2290	110	110	1700	190	550	800	390	230	230	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.01	1.82	1.82	2.00	2.11	2.00	2.00	2.05	2.17	2.17	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	2290	27	110	1700	47	550	800	97	230	230	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	573	7	28	425	12	138	200	24	58	58	8
Total Analysis Volume [veh/h]	150	2290	27	110	1700	47	550	800	97	230	230	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.45	0.02	0.03	0.33	0.03	0.16	0.12	0.06	0.07	0.05	0.02
Intersection LOS	C											
Intersection V/C	0.738											

Intersection Level Of Service Report
Intersection 15:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

Intersection Setup

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Approach	Northbound			Northeastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	0	2	0	1
Pocket Length [ft]	210.00	100.00	280.00	275.00	100.00	405.00	160.00	100.00	100.00	175.00	100.00	225.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Base Volume Input [veh/h]	560	930	390	170	890	190	290	1470	260	190	560	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	2.04	2.05	1.76	2.02	2.11	2.07	1.97	1.92	2.11	1.96	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	560	930	97	170	890	47	290	1470	260	190	560	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	140	233	24	43	223	12	73	368	65	48	140	16
Total Analysis Volume [veh/h]	560	930	97	170	890	47	290	1470	260	190	560	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	5	2	2	1	6	6	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.18	0.06	0.05	0.17	0.03	0.09	0.34	0.34	0.06	0.11	0.04
Intersection LOS	C											
Intersection V/C	0.714											

Intersection Level Of Service Report
Intersection 16:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

Intersection Setup

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Approach	Southbound		Northeastbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	0	0	1	0
Pocket Length [ft]	100.00	200.00	100.00	100.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Base Volume Input [veh/h]	700	340	330	290	370	1580
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.06	2.12	2.07	1.89	2.03
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	700	122	330	35	370	1580
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	175	31	83	9	93	395
Total Analysis Volume [veh/h]	700	122	330	35	370	1580
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Split	Split	Protected	Permissive
Signal Group	4	4	2	2	3	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lag	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.07	0.19	0.02	0.22	0.31
Intersection LOS	A					
Intersection V/C	0.599					

Intersection Level Of Service Report
Intersection 17:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	360.00	100.00	305.00	165.00	100.00	175.00	225.00	100.00	230.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Base Volume Input [veh/h]	120	790	160	300	1680	630	300	910	240	300	480	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	2.03	1.88	2.00	2.02	2.06	2.00	1.98	2.08	2.00	2.08	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	790	40	300	1680	157	300	910	60	300	480	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	198	10	75	420	39	75	228	15	75	120	30
Total Analysis Volume [veh/h]	120	790	40	300	1680	157	300	910	60	300	480	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3			6,7						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.15	0.00	0.09	0.33	0.00	0.09	0.18	0.04	0.09	0.12	0.12
Intersection LOS	B											
Intersection V/C	0.681											

Intersection Level Of Service Report
Intersection 18:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.865

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	180.00	100.00	205.00	205.00	100.00	225.00	285.00	100.00	100.00	205.00	100.00	110.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	320	2440	70	90	2270	160	270	450	120	50	60	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.88	2.01	1.43	2.22	1.98	1.88	1.85	2.00	1.67	2.00	1.67	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	320	2440	17	90	2270	40	270	450	120	50	60	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	610	4	23	568	10	68	113	30	13	15	4
Total Analysis Volume [veh/h]	320	2440	17	90	2270	40	270	450	120	50	60	15
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.48	0.01	0.05	0.45	0.02	0.16	0.17	0.17	0.01	0.02	0.01
Intersection LOS	D											
Intersection V/C	0.865											

Intersection Level Of Service Report
Intersection 19:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Approach	Eastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	185.00	180.00	100.00	200.00	155.00	100.00	100.00	135.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	160	1150	70	40	1890	150	160	400	50	20	130	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.88	2.00	1.43	2.50	2.01	2.00	1.88	2.00	2.00	0.00	2.31	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	1150	17	40	1890	37	160	400	50	20	130	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	288	4	10	473	9	40	100	13	5	33	9
Total Analysis Volume [veh/h]	160	1150	17	40	1890	37	160	400	50	20	130	35
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.23	0.01	0.02	0.37	0.02	0.09	0.13	0.13	0.01	0.05	0.05
Intersection LOS	B											
Intersection V/C	0.658											

Intersection Level Of Service Report
Intersection 20:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.601

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	110.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	90	380	210	170	600	220	320	210	40	40	170	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.22	2.11	1.90	1.76	2.00	1.82	1.88	1.90	2.50	2.50	1.76	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	380	210	170	600	220	320	210	40	40	170	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	95	53	43	150	55	80	53	10	10	43	15
Total Analysis Volume [veh/h]	90	380	210	170	600	220	320	210	40	40	170	60
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	157
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.17	0.17	0.10	0.24	0.24	0.19	0.07	0.07	0.02	0.07	0.07
Intersection LOS	B											
Intersection V/C	0.601											

Intersection Level Of Service Report
Intersection 21:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	250.00	100.00	250.00	210.00	100.00	1000.0	100.00	100.00	25.00	170.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	140	1040	30	20	1770	300	40	30	10	160	30	240
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.02	3.33	0.00	1.98	2.00	2.50	3.33	0.00	1.88	3.33	2.08
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	1040	7	20	1770	75	40	30	2	160	30	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	260	2	5	443	19	10	8	1	40	8	15
Total Analysis Volume [veh/h]	140	1040	7	20	1770	75	40	30	2	160	30	60
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.20	0.00	0.01	0.35	0.04	0.02	0.04	0.00	0.05	0.06	0.04
Intersection LOS	A											
Intersection V/C	0.576											

Intersection Level Of Service Report
Intersection 22:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.925

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	350.00	100.00	190.00	285.00	100.00	200.00	255.00	100.00	100.00	150.00	100.00	80.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	440	2680	80	60	2500	170	400	530	150	10	70	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.05	2.01	2.50	1.67	2.00	1.76	2.00	2.08	2.00	0.00	1.43	2.31
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	440	2680	20	60	2500	42	400	530	150	10	70	32
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	670	5	15	625	11	100	133	38	3	18	8
Total Analysis Volume [veh/h]	440	2680	20	60	2500	42	400	530	150	10	70	32
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.53	0.01	0.04	0.49	0.02	0.24	0.20	0.20	0.00	0.02	0.02
Intersection LOS	E											
Intersection V/C	0.925											

Intersection Level Of Service Report
Intersection 23:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	195.00	100.00	300.00	255.00	100.00	275.00	240.00	100.00	100.00	190.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	270	1550	410	100	980	200	300	640	350	100	180	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.85	2.00	1.95	2.00	2.04	2.00	2.00	2.03	2.00	2.00	2.22	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	1550	102	100	980	50	300	640	87	100	180	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	388	26	25	245	13	75	160	22	25	45	4
Total Analysis Volume [veh/h]	270	1550	102	100	980	50	300	640	87	100	180	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.30	0.06	0.06	0.19	0.03	0.18	0.21	0.21	0.06	0.05	0.01
Intersection LOS	B											
Intersection V/C	0.685											

Intersection Level Of Service Report
Intersection 24:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.556

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	115.00	175.00	100.00	95.00	95.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	110	410	150	130	500	440	200	660	130	110	400	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.95	2.00	2.31	2.00	2.05	2.00	1.97	2.31	1.82	2.00	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	410	37	130	500	110	200	660	130	110	400	170
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	103	9	33	125	28	50	165	33	28	100	43
Total Analysis Volume [veh/h]	110	410	37	130	500	110	200	660	130	110	400	170
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	105
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.12	0.02	0.08	0.15	0.06	0.12	0.23	0.23	0.06	0.17	0.17
Intersection LOS	A											
Intersection V/C	0.556											

Intersection Level Of Service Report
Intersection 25:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	1	0	0
Pocket Length [ft]	195.00	100.00	125.00	360.00	100.00	575.00	155.00	100.00	145.00	180.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	80	890	310	340	1590	200	410	680	280	100	440	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	2.02	1.94	2.06	2.01	2.00	1.95	2.06	2.14	2.00	2.05	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	890	77	340	1590	50	410	680	70	100	440	190
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	223	19	85	398	13	103	170	18	25	110	48
Total Analysis Volume [veh/h]	80	890	77	340	1590	50	410	680	70	100	440	190
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.17	0.00	0.10	0.31	0.03	0.12	0.20	0.04	0.06	0.19	0.19
Intersection LOS	B											
Intersection V/C	0.691											

Intersection Level Of Service Report
Intersection 26:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.781

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	285.00	100.00	100.00	295.00	100.00	110.00	180.00	100.00	175.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	240	760	200	380	1540	250	280	650	130	180	700	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.08	1.97	2.00	2.11	2.01	2.00	2.14	2.00	2.31	2.22	2.00	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	240	760	50	380	1540	62	280	650	32	180	700	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	190	13	95	385	16	70	163	8	45	175	21
Total Analysis Volume [veh/h]	240	760	50	380	1540	62	280	650	32	180	700	85
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.15	0.03	0.22	0.30	0.04	0.08	0.19	0.02	0.05	0.21	0.05
Intersection LOS	C											
Intersection V/C	0.781											

Intersection Level Of Service Report
Intersection 27:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	295.00	100.00	285.00	235.00	100.00	290.00	245.00	100.00	210.00	185.00	100.00	255.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	70	970	290	80	1640	180	350	590	210	70	210	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.43	1.96	2.07	2.50	2.01	2.22	2.00	2.03	1.90	1.43	1.90	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	970	72	80	1640	45	350	590	52	70	210	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	243	18	20	410	11	88	148	13	18	53	2
Total Analysis Volume [veh/h]	70	970	72	80	1640	45	350	590	52	70	210	7
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.04	0.02	0.32	0.03	0.10	0.17	0.03	0.02	0.06	0.00
Intersection LOS	A											
Intersection V/C	0.586											

Intersection Level Of Service Report
Intersection 28:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.494

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	185.00	100.00	190.00	175.00	100.00	200.00	180.00	100.00	95.00	300.00	100.00	125.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	110	320	90	190	340	350	80	630	150	90	430	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.88	2.22	2.11	2.06	2.00	2.50	2.06	2.00	2.22	2.09	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	320	22	190	340	87	80	630	37	90	430	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	80	6	48	85	22	20	158	9	23	108	4
Total Analysis Volume [veh/h]	110	320	22	190	340	87	80	630	37	90	430	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.09	0.01	0.11	0.10	0.05	0.05	0.19	0.02	0.05	0.13	0.01
Intersection LOS	A											
Intersection V/C	0.494											

Intersection Level Of Service Report
Intersection 29:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	245.00	100.00	100.00	150.00	100.00	345.00	215.00	100.00	120.00	170.00	100.00	295.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	160	910	220	190	1760	120	350	830	80	190	410	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.88	1.98	1.82	2.11	1.99	1.67	2.00	2.05	2.50	2.11	1.95	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	910	55	190	1760	30	350	830	20	190	410	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	228	14	48	440	8	88	208	5	48	103	16
Total Analysis Volume [veh/h]	160	910	55	190	1760	30	350	830	20	190	410	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.18	0.03	0.06	0.35	0.02	0.10	0.24	0.01	0.06	0.12	0.04
Intersection LOS	C											
Intersection V/C	0.742											

Intersection Level Of Service Report
Intersection 30:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	210.00	100.00	410.00	190.00	100.00	125.00	250.00	100.00	145.00	305.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	220	720	260	440	1230	450	230	450	200	180	580	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.94	1.92	2.05	2.03	2.00	2.17	2.00	2.00	2.22	2.07	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	720	65	440	1230	112	230	450	200	180	580	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	180	16	110	308	28	58	113	50	45	145	53
Total Analysis Volume [veh/h]	220	720	65	440	1230	112	230	450	200	180	580	210
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.14	0.04	0.13	0.24	0.07	0.07	0.13	0.12	0.05	0.23	0.23
Intersection LOS	B											
Intersection V/C	0.656											

Intersection Level Of Service Report
Intersection 31:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	1	2	0	1	2	0	2
Pocket Length [ft]	225.00	100.00	290.00	165.00	100.00	180.00	260.00	100.00	155.00	145.00	100.00	250.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	440	1250	390	380	1930	260	490	520	260	110	220	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.05	2.00	2.05	2.11	2.02	1.92	2.04	1.92	1.92	1.82	1.82	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	440	1250	97	380	1930	260	490	520	65	110	220	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	313	24	95	483	65	123	130	16	28	55	16
Total Analysis Volume [veh/h]	440	1250	97	380	1930	260	490	520	65	110	220	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.25	0.06	0.11	0.32	0.32	0.14	0.15	0.04	0.03	0.06	0.00
Intersection LOS	B											
Intersection V/C	0.687											

Intersection Level Of Service Report
Intersection 32:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	155.00	100.00	100.00	100.00	170.00	100.00	100.00	255.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	60	80	40	110	40	240	40	600	80	70	660	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	2.50	2.50	1.82	2.50	2.08	2.50	2.00	2.50	1.43	1.97	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	80	10	110	40	240	40	600	80	70	660	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	20	3	28	10	60	10	150	20	18	165	8
Total Analysis Volume [veh/h]	60	80	10	110	40	240	40	600	80	70	660	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	149
Lost time [s]	7.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	5	5	6	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.05	0.01	0.06	0.11	0.11	0.02	0.20	0.20	0.04	0.20	0.20
Intersection LOS	A											
Intersection V/C	0.450											

Intersection Level Of Service Report
Intersection 33:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	2	0	1	2	0	1
Pocket Length [ft]	250.00	100.00	235.00	200.00	100.00	100.00	195.00	100.00	200.00	245.00	100.00	155.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	490	1090	220	250	2030	60	810	190	170	80	260	600
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.04	2.02	1.82	2.00	2.02	1.67	1.98	2.11	1.76	2.50	1.92	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	490	1090	55	250	2030	60	810	190	42	80	260	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	123	273	14	63	508	15	203	48	11	20	65	38
Total Analysis Volume [veh/h]	490	1090	55	250	2030	60	810	190	42	80	260	150
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Unsign
Signal Group	5	2	2	1	6	6	3	8	8	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.16	0.03	0.07	0.31	0.31	0.24	0.06	0.02	0.02	0.08	0.00
Intersection LOS	D											
Intersection V/C	0.816											

Intersection Level Of Service Report
Intersection 34:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.663

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	160.00	100.00	160.00	100.00	100.00	50.00	250.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	260	710	10	20	1080	490	10	50	40	360	10	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	1.97	0.00	0.00	2.04	2.04	0.00	2.00	2.50	1.94	0.00	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	710	10	20	1080	122	10	50	40	360	10	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	178	3	5	270	31	3	13	10	90	3	16
Total Analysis Volume [veh/h]	260	710	10	20	1080	122	10	50	40	360	10	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.21	0.21	0.01	0.32	0.07	0.01	0.03	0.03	0.11	0.11	0.04
Intersection LOS	B											
Intersection V/C	0.663											

Intersection Level Of Service Report
Intersection 35:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.518

Intersection Setup

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Approach	Northbound			Eastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	640.00	100.00	640.00	190.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Base Volume Input [veh/h]	690	0	630	0	1820	0	0	1360	1390	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	0.00	2.06	0.00	1.98	0.00	0.00	1.99	2.01	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	690	0	157	0	1820	0	0	1360	347	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	173	0	39	0	455	0	0	340	87	0	0	0
Total Analysis Volume [veh/h]	690	0	157	0	1820	0	0	1360	347	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	8	0	8	0	2	0	0	6	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.00	0.05	0.00	0.27	0.00	0.00	0.27	0.20	0.00	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.518											

Intersection Level Of Service Report
Intersection 36:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.645

Intersection Setup

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	125.00	100.00	125.00	100.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	465.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	190	0	300	1070	290	660	0	1090	80	360	1530	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.11	0.00	2.00	1.96	2.07	1.97	0.00	2.02	2.50	1.94	2.03	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	190	0	300	1070	290	165	0	1090	80	360	1530	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	0	75	268	73	41	0	273	20	90	383	29
Total Analysis Volume [veh/h]	190	0	300	1070	290	165	0	1090	80	360	1530	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Permis	Permis	Permis	Protect	Permis	Permis
Signal Group	8	0	8	4	4	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	-	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.09	0.21	0.09	0.10	0.00	0.17	0.17	0.11	0.30	0.07
Intersection LOS	B											
Intersection V/C	0.645											

Intersection Level Of Service Report
Intersection 37:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

Intersection Setup

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	2	1	0	1	2	0	1
Pocket Length [ft]	145.00	100.00	100.00	100.00	100.00	265.00	35.00	100.00	120.00	135.00	100.00	45.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	140	50	40	860	990	20	10	580	670	160	300	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.00	2.50	1.98	2.02	0.00	0.00	2.07	1.94	1.88	2.00	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	50	10	860	990	20	10	580	167	160	300	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	13	3	215	248	5	3	145	42	40	75	18
Total Analysis Volume [veh/h]	140	50	10	860	990	20	10	580	167	160	300	70
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Protect	Permis	Protect	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	8	1	6	6
Auxiliary Signal Groups			4,5									
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.03	0.00	0.25	0.30	0.30	0.01	0.17	0.10	0.05	0.09	0.04
Intersection LOS	B											
Intersection V/C	0.606											

Intersection Level Of Service Report
Intersection 38:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.781

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	1
Pocket Length [ft]	110.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	410.00	165.00	100.00	165.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Base Volume Input [veh/h]	100	1270	790	0	3840	90	400	70	450	50	10	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.97	2.03	0.00	2.01	2.22	2.00	1.43	2.00	2.00	0.00	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	1270	197	0	3840	90	400	70	450	50	10	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	318	49	0	960	23	100	18	113	13	3	53
Total Analysis Volume [veh/h]	100	1270	197	0	3840	90	400	70	450	50	10	210
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.25	0.12	0.00	0.46	0.46	0.12	0.18	0.18	0.03	0.01	0.06
Intersection LOS	C											
Intersection V/C	0.781											

Intersection Level Of Service Report
Intersection 39:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.472

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	2	0	1	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	305.00	100.00	135.00	215.00	100.00	100.00	215.00	100.00	90.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	0	1160	20	130	1260	1070	40	200	410	890	260	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.98	0.00	2.31	1.98	1.96	2.50	2.00	1.95	2.02	1.92	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1160	20	130	1260	267	40	200	102	890	260	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	290	5	33	315	67	10	50	26	223	65	4
Total Analysis Volume [veh/h]	0	1160	20	130	1260	267	40	200	102	890	260	15
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Protect	Permis	Permis	Permis	Permis	Overla	Split	Split	Split
Signal Group	0	2	2	1	6	6	8	8	1	4	4	4
Auxiliary Signal Groups									1,8			
Lead / Lag	-	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.17	0.17	0.04	0.25	0.16	0.02	0.14	0.00	0.17	0.08	0.01
Intersection LOS	A											
Intersection V/C	0.472											

Intersection Level Of Service Report
Intersection 40:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	0	0	1	1	0	0
Pocket Length [ft]	295.00	100.00	195.00	135.00	100.00	100.00	100.00	100.00	95.00	165.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Base Volume Input [veh/h]	1100	1690	10	40	1030	330	10	30	30	120	60	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.01	0.00	2.50	2.04	2.12	0.00	3.33	3.33	1.67	1.67	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1100	1690	2	40	1030	82	10	30	7	120	60	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	275	423	1	10	258	21	3	8	2	30	15	29
Total Analysis Volume [veh/h]	1100	1690	2	40	1030	82	10	30	7	120	60	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	182
Lost time [s]	9.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Protect	Permis	Permis	Permis	Split	Split	Split
Signal Group	5	2	2	1	6	4	8	8	1	4	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.32	0.33	0.00	0.01	0.20	0.05	0.01	0.01	0.00	0.04	0.05	0.07
Intersection LOS	B											
Intersection V/C	0.650											

Intersection Level Of Service Report
Intersection 41:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

Intersection Setup

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Approach	Southbound			Northeastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	200.00	100.00	205.00	225.00	100.00	230.00	260.00	100.00	155.00	245.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Base Volume Input [veh/h]	50	60	230	70	810	160	250	1660	70	260	70	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.67	2.17	1.43	1.98	1.88	2.00	1.99	1.43	1.92	1.43	2.50
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	60	57	70	810	40	250	1660	17	260	70	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	15	14	18	203	10	63	415	4	65	18	5
Total Analysis Volume [veh/h]	50	60	57	70	810	40	250	1660	17	260	70	20
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	111
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	7	4	4	5	2	2	1	6	6	3	8	8
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.03	0.04	0.16	0.02	0.07	0.33	0.01	0.15	0.02	0.01
Intersection LOS	B											
Intersection V/C	0.607											

Intersection Level Of Service Report
Intersection 42:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Approach	Eastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	2	0
Pocket Length [ft]	100.00	100.00	305.00	100.00	260.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Base Volume Input [veh/h]	790	610	350	2030	450	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	1.97	2.00	2.02	2.00	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	790	610	350	2030	450	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	198	153	88	508	113	7
Total Analysis Volume [veh/h]	790	610	350	2030	450	27
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	8	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.27	0.27	0.21	0.40	0.13	0.02
Intersection LOS	B					
Intersection V/C	0.667					

Intersection Level Of Service Report
Intersection 51:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.443

Intersection Setup

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Approach	Eastbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	255.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Base Volume Input [veh/h]	60	180	220	540	930	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	2.22	1.82	2.04	2.04	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	45	220	540	930	250
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	11	55	135	233	63
Total Analysis Volume [veh/h]	60	45	220	540	930	250
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	7	5	5	2	6	6
Auxiliary Signal Groups		5				
Lead / Lag	Lag	-	Lead	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.13	0.11	0.23	0.23
Intersection LOS	A					
Intersection V/C	0.443					

Intersection Level Of Service Report
Intersection 56:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.811

Intersection Setup

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Approach	Northbound			Southbound			Eastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	2	1	0	1	1	0	1
Pocket Length [ft]	170.00	100.00	170.00	100.00	100.00	165.00	290.00	100.00	225.00	295.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Base Volume Input [veh/h]	260	10	330	170	160	160	30	970	160	520	1320	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	0.00	2.12	1.76	1.88	1.88	3.33	1.96	1.88	1.92	1.97	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	10	82	170	160	40	30	970	40	520	1320	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	3	21	43	40	10	8	243	10	130	330	6
Total Analysis Volume [veh/h]	260	10	82	170	160	40	30	970	40	520	1320	25
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.05	0.10	0.09	0.02	0.02	0.29	0.02	0.31	0.39	0.01
Intersection LOS	D											
Intersection V/C	0.811											

Intersection Level Of Service Report
Intersection 57:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	140.00	100.00	175.00	105.00	100.00	200.00	100.00	100.00	35.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Base Volume Input [veh/h]	360	640	10	20	620	440	10	10	10	400	10	310
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	2.03	0.00	0.00	1.94	2.05	0.00	0.00	0.00	2.00	0.00	1.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	360	640	2	20	620	110	10	10	10	400	10	77
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	160	1	5	155	28	3	3	3	100	3	19
Total Analysis Volume [veh/h]	360	640	2	20	620	110	10	10	10	400	10	77
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.19	0.00	0.01	0.18	0.06	0.01	0.01	0.01	0.12	0.12	0.05
Intersection LOS	A											
Intersection V/C	0.576											

Intersection Level Of Service Report
Intersection 60:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.590

Intersection Setup

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Approach	Southbound			Eastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left2	Left	Right	Left2	Left	Thru	Left	Thru	Right	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	210.00	100.00	100.00	140.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Base Volume Input [veh/h]	40	250	70	90	170	270	10	10	10	620	560	270
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	2.00	1.43	2.22	1.76	1.85	0.00	0.00	0.00	1.94	1.96	1.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	250	17	90	170	270	10	10	10	620	560	270
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	63	4	23	43	68	3	3	3	155	140	68
Total Analysis Volume [veh/h]	40	250	17	90	170	270	10	10	10	620	560	270
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	129
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis
Signal Group	1	6	6	4	4	4	8	8	8	5	2	2
Auxiliary Signal Groups												
Lead / Lag	Lead	Lag	-	Lag	Lag	-	Lag	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.07	0.08	0.05	0.10	0.16	0.01	0.01	0.01	0.36	0.24	0.24
Intersection LOS	A											
Intersection V/C	0.590											

Intersection Level Of Service Report
Intersection 101:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Approach	Eastbound			Westbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	1
Pocket Length [ft]	65.00	100.00	100.00	60.00	100.00	100.00	150.00	100.00	190.00	155.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	20	20	40	440	20	100	10	760	220	140	900	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.50	2.05	0.00	2.00	0.00	1.97	1.82	2.14	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	20	40	440	20	100	10	760	55	140	900	2
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	5	10	110	5	25	3	190	14	35	225	1
Total Analysis Volume [veh/h]	20	20	40	440	20	100	10	760	55	140	900	2
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.04	0.04	0.26	0.07	0.07	0.01	0.22	0.03	0.08	0.26	0.00
Intersection LOS	B											
Intersection V/C	0.650											

Intersection Level Of Service Report
Intersection 102:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.490

Intersection Setup

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Base Volume Input [veh/h]	110	1040	1630	90	70	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	2.02	2.02	2.22	1.43	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1040	1630	90	70	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	260	408	23	18	13
Total Analysis Volume [veh/h]	110	1040	1630	90	70	52
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Overlap
Signal Group	5	2	6	6	7	5
Auxiliary Signal Groups						5
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.20	0.34	0.34	0.04	0.00
Intersection LOS	A					
Intersection V/C	0.490					

Lake Forest GPU (Constrained AM)

Vistro File: H:\...\2040_Constrained_AM.vistro
Report File: H:\...\Constrained_AM_LOS.pdf

Scenario: Base Scenario
10/7/2019

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		130	30	480	240	280	20	520	260	140	20	380	190	2690

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		130	210	300	260	390	190	480	330	140	360	370	150	3310

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		120	220	250	200	390	20	600	860	240	30	760	210	3900

ID	Intersection Name	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
		Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		240	1250	700	710	120	870	90	50	120	220	840	120	5330

ID	Intersection Name	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		210	1060	390	430	1470	60	200	430	340	110	4700

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		380	540	140	50	1100	840	150	100	460	760	4520

ID	Intersection Name	Northbound		Southwestbound		Total Volume
		Left	Thru	Thru	Right	
7		150	1170	860	630	2810

ID	Intersection Name	Northbound	Southbound	Southeastbound		Total Volume
		Thru	Thru	Left	Right	
8		1010	930	400	170	2510

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
9		750	310	200	1050	820	190	3320

ID	Intersection Name	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		260	710	150	70	720	260	280	900	150	80	280	50	3910

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		460	890	390	170	1430	410	70	70	50	140	350	340	4770

ID	Intersection Name	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		410	1990	30	150	1010	320	420	210	440	20	650	570	6220

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		30	1370	150	240	1140	650	380	230	20	160	360	270	5000

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		150	2290	110	110	1700	190	550	800	390	230	230	120	6870

ID	Intersection Name	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		560	930	390	170	890	190	290	1470	260	190	560	250	6150

ID	Intersection Name	Southbound		Northeastbound		Northwestbound		Total Volume
		Thru	Right	Left	Right	Left	Thru	
16		700	340	330	290	370	1580	3610

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		120	790	160	300	1680	630	300	910	240	300	480	120	6030

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		320	2440	70	90	2270	160	270	450	120	50	60	60	6360

ID	Intersection Name	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		160	1150	70	40	1890	150	160	400	50	20	130	140	4360

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		90	380	210	170	600	220	320	210	40	40	170	60	2510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		140	1040	30	20	1770	300	40	30	10	160	30	240	3810

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		440	2680	80	60	2500	170	400	530	150	10	70	130	7220

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		270	1550	410	100	980	200	300	640	350	100	180	70	5150

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		110	410	150	130	500	440	200	660	130	110	400	170	3410

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		80	890	310	340	1590	200	410	680	280	100	440	190	5510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		240	760	200	380	1540	250	280	650	130	180	700	340	5650

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		70	970	290	80	1640	180	350	590	210	70	210	30	4690

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		110	320	90	190	340	350	80	630	150	90	430	70	2850

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		160	910	220	190	1760	120	350	830	80	190	410	260	5480

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		220	720	260	440	1230	450	230	450	200	180	580	210	5170

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		440	1250	390	380	1930	260	490	520	260	110	220	260	6510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		60	80	40	110	40	240	40	600	80	70	660	30	2050

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		490	1090	220	250	2030	60	810	190	170	80	260	600	6250

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		260	710	10	20	1080	490	10	50	40	360	10	260	3300

ID	Intersection Name	Northbound		Eastbound	Southwestbound		Total Volume
		Left	Right	Thru	Thru	Right	
35		690	630	1820	1360	1390	5890

ID	Intersection Name	Northbound		Southbound			Eastbound		Westbound			Total Volume
		Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		190	300	1070	290	660	1090	80	360	1530	470	6040

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		140	50	40	860	990	20	10	580	670	160	300	70	3890

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		100	1270	790	0	3840	90	400	70	450	50	10	210	7280

ID	Intersection Name	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
		Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		1160	20	130	1260	1070	40	200	410	890	260	60	5500

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		1100	1690	10	40	1030	330	10	30	30	120	60	470	4920

ID	Intersection Name	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		50	60	230	70	810	160	250	1660	70	260	70	80	3770

ID	Intersection Name	Eastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
42		790	610	350	2030	450	110	4340

ID	Intersection Name	Eastbound		Northeastbound		Southwestbound		Total Volume
		Left	Right	Left	Thru	Thru	Right	
51		60	180	220	540	930	250	2180

ID	Intersection Name	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		260	10	330	170	160	160	30	970	160	520	1320	100	4190

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		360	640	10	20	620	440	10	10	10	400	10	310	2840

ID	Intersection Name	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
		2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		40	250	70	90	170	270	10	10	10	620	560	270	2370

ID	Intersection Name	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		20	20	40	440	20	100	10	760	220	140	900	10	2680

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
102		110	1040	1630	90	70	210	3150

Lake Forest GPU (Constrained AM)

Vistro File: H:\...\2040_Constrained_AM.vistro
Report File: H:\...\Constrained_AM_LOS.pdf

Scenario: Base Scenario
10/7/2019

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		Final Base	130	30	480	240	280	20	520	260	140	20	380	190	2690
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**130**	**30**	**480**	**240**	**280**	**20**	**520**	**260**	**140**	**20**	**380**	**190**	**2690**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		Final Base	130	210	300	260	390	190	480	330	140	360	370	150	3310
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**130**	**210**	**300**	**260**	**390**	**190**	**480**	**330**	**140**	**360**	**370**	**150**	**3310**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		Final Base	120	220	250	200	390	20	600	860	240	30	760	210	3900
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**120**	**220**	**250**	**200**	**390**	**20**	**600**	**860**	**240**	**30**	**760**	**210**	**3900**

ID	Intersection Name	Volume Type	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
			Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		Final Base	240	1250	700	710	120	870	90	50	120	220	840	120	5330
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**240**	**1250**	**700**	**710**	**120**	**870**	**90**	**50**	**120**	**220**	**840**	**120**	**5330**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		Final Base	210	1060	390	430	1470	60	200	430	340	110	4700
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**210**	**1060**	**390**	**430**	**1470**	**60**	**200**	**430**	**340**	**110**	**4700**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		Final Base	380	540	140	50	1100	840	150	100	460	760	4520
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**380**	**540**	**140**	**50**	**1100**	**840**	**150**	**100**	**460**	**760**	**4520**

ID	Intersection Name	Volume Type	Northbound		Southwestbound		Total Volume
			Left	Thru	Thru	Right	
7		Final Base	150	1170	860	630	2810
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**150**	**1170**	**860**	**630**	**2810**

ID	Intersection Name	Volume Type	Northbound	Southbound	Southeastbound		Total Volume
			Thru	Thru	Left	Right	
8		Final Base	1010	930	400	170	2510
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**1010**	**930**	**400**	**170**	**2510**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
9		Final Base	750	310	200	1050	820	190	3320
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**750**	**310**	**200**	**1050**	**820**	**190**	**3320**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		Final Base	260	710	150	70	720	260	280	900	150	80	280	50	3910
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**710**	**150**	**70**	**720**	**260**	**280**	**900**	**150**	**80**	**280**	**50**	**3910**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		Final Base	460	890	390	170	1430	410	70	70	50	140	350	340	4770
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**460**	**890**	**390**	**170**	**1430**	**410**	**70**	**70**	**50**	**140**	**350**	**340**	**4770**

ID	Intersection Name	Volume Type	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		Final Base	410	1990	30	150	1010	320	420	210	440	20	650	570	6220
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**410**	**1990**	**30**	**150**	**1010**	**320**	**420**	**210**	**440**	**20**	**650**	**570**	**6220**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		Final Base	30	1370	150	240	1140	650	380	230	20	160	360	270	5000
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**1370**	**150**	**240**	**1140**	**650**	**380**	**230**	**20**	**160**	**360**	**270**	**5000**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		Final Base	150	2290	110	110	1700	190	550	800	390	230	230	120	6870
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**150**	**2290**	**110**	**110**	**1700**	**190**	**550**	**800**	**390**	**230**	**230**	**120**	**6870**

ID	Intersection Name	Volume Type	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		Final Base	560	930	390	170	890	190	290	1470	260	190	560	250	6150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**560**	**930**	**390**	**170**	**890**	**190**	**290**	**1470**	**260**	**190**	**560**	**250**	**6150**

ID	Intersection Name	Volume Type	Southbound		Northeastbound		Northwestbound		Total Volume
			Thru	Right	Left	Right	Left	Thru	
16		Final Base	700	340	330	290	370	1580	3610
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**700**	**340**	**330**	**290**	**370**	**1580**	**3610**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		Final Base	120	790	160	300	1680	630	300	910	240	300	480	120	6030
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**120**	**790**	**160**	**300**	**1680**	**630**	**300**	**910**	**240**	**300**	**480**	**120**	**6030**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		Final Base	320	2440	70	90	2270	160	270	450	120	50	60	60	6360
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**320**	**2440**	**70**	**90**	**2270**	**160**	**270**	**450**	**120**	**50**	**60**	**60**	**6360**

ID	Intersection Name	Volume Type	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		Final Base	160	1150	70	40	1890	150	160	400	50	20	130	140	4360
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**160**	**1150**	**70**	**40**	**1890**	**150**	**160**	**400**	**50**	**20**	**130**	**140**	**4360**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		Final Base	90	380	210	170	600	220	320	210	40	40	170	60	2510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**90**	**380**	**210**	**170**	**600**	**220**	**320**	**210**	**40**	**40**	**170**	**60**	**2510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		Final Base	140	1040	30	20	1770	300	40	30	10	160	30	240	3810
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**1040**	**30**	**20**	**1770**	**300**	**40**	**30**	**10**	**160**	**30**	**240**	**3810**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		Final Base	440	2680	80	60	2500	170	400	530	150	10	70	130	7220
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**440**	**2680**	**80**	**60**	**2500**	**170**	**400**	**530**	**150**	**10**	**70**	**130**	**7220**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		Final Base	270	1550	410	100	980	200	300	640	350	100	180	70	5150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**270**	**1550**	**410**	**100**	**980**	**200**	**300**	**640**	**350**	**100**	**180**	**70**	**5150**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		Final Base	110	410	150	130	500	440	200	660	130	110	400	170	3410
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**410**	**150**	**130**	**500**	**440**	**200**	**660**	**130**	**110**	**400**	**170**	**3410**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		Final Base	80	890	310	340	1590	200	410	680	280	100	440	190	5510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**80**	**890**	**310**	**340**	**1590**	**200**	**410**	**680**	**280**	**100**	**440**	**190**	**5510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		Final Base	240	760	200	380	1540	250	280	650	130	180	700	340	5650
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**240**	**760**	**200**	**380**	**1540**	**250**	**280**	**650**	**130**	**180**	**700**	**340**	**5650**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		Final Base	70	970	290	80	1640	180	350	590	210	70	210	30	4690
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**70**	**970**	**290**	**80**	**1640**	**180**	**350**	**590**	**210**	**70**	**210**	**30**	**4690**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		Final Base	110	320	90	190	340	350	80	630	150	90	430	70	2850
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**320**	**90**	**190**	**340**	**350**	**80**	**630**	**150**	**90**	**430**	**70**	**2850**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		Final Base	160	910	220	190	1760	120	350	830	80	190	410	260	5480
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**160**	**910**	**220**	**190**	**1760**	**120**	**350**	**830**	**80**	**190**	**410**	**260**	**5480**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		Final Base	220	720	260	440	1230	450	230	450	200	180	580	210	5170
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**220**	**720**	**260**	**440**	**1230**	**450**	**230**	**450**	**200**	**180**	**580**	**210**	**5170**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		Final Base	440	1250	390	380	1930	260	490	520	260	110	220	260	6510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**440**	**1250**	**390**	**380**	**1930**	**260**	**490**	**520**	**260**	**110**	**220**	**260**	**6510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		Final Base	60	80	40	110	40	240	40	600	80	70	660	30	2050
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**60**	**80**	**40**	**110**	**40**	**240**	**40**	**600**	**80**	**70**	**660**	**30**	**2050**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		Final Base	490	1090	220	250	2030	60	810	190	170	80	260	600	6250
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**490**	**1090**	**220**	**250**	**2030**	**60**	**810**	**190**	**170**	**80**	**260**	**600**	**6250**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		Final Base	260	710	10	20	1080	490	10	50	40	360	10	260	3300
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**710**	**10**	**20**	**1080**	**490**	**10**	**50**	**40**	**360**	**10**	**260**	**3300**

ID	Intersection Name	Volume Type	Northbound		Eastbound	Southwestbound		Total Volume
			Left	Right	Thru	Thru	Right	
35		Final Base	690	630	1820	1360	1390	5890
		Growth Factor	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0
		Other	0	0	0	0	0	0
		Future Total	**690**	**630**	**1820**	**1360**	**1390**	**5890**

ID	Intersection Name	Volume Type	Northbound		Southbound			Eastbound		Westbound			Total Volume
			Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		Final Base	190	300	1070	290	660	1090	80	360	1530	470	6040
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**190**	**300**	**1070**	**290**	**660**	**1090**	**80**	**360**	**1530**	**470**	**6040**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		Final Base	140	50	40	860	990	20	10	580	670	160	300	70	3890
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**50**	**40**	**860**	**990**	**20**	**10**	**580**	**670**	**160**	**300**	**70**	**3890**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		Final Base	100	1270	790	0	3840	90	400	70	450	50	10	210	7280
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**100**	**1270**	**790**	**0**	**3840**	**90**	**400**	**70**	**450**	**50**	**10**	**210**	**7280**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
			Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		Final Base	1160	20	130	1260	1070	40	200	410	890	260	60	5500
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1160**	**20**	**130**	**1260**	**1070**	**40**	**200**	**410**	**890**	**260**	**60**	**5500**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		Final Base	1100	1690	10	40	1030	330	10	30	30	120	60	470	4920
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1100**	**1690**	**10**	**40**	**1030**	**330**	**10**	**30**	**30**	**120**	**60**	**470**	**4920**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		Final Base	50	60	230	70	810	160	250	1660	70	260	70	80	3770
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**50**	**60**	**230**	**70**	**810**	**160**	**250**	**1660**	**70**	**260**	**70**	**80**	**3770**

ID	Intersection Name	Volume Type	Eastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
42		Final Base	790	610	350	2030	450	110	4340
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**790**	**610**	**350**	**2030**	**450**	**110**	**4340**

ID	Intersection Name	Volume Type	Eastbound		Northeastbound		Southwestbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
51		Final Base	60	180	220	540	930	250	2180
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**60**	**180**	**220**	**540**	**930**	**250**	**2180**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		Final Base	260	10	330	170	160	160	30	970	160	520	1320	100	4190
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**10**	**330**	**170**	**160**	**160**	**30**	**970**	**160**	**520**	**1320**	**100**	**4190**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		Final Base	360	640	10	20	620	440	10	10	10	400	10	310	2840
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**360**	**640**	**10**	**20**	**620**	**440**	**10**	**10**	**10**	**400**	**10**	**310**	**2840**

ID	Intersection Name	Volume Type	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
			2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		Final Base	40	250	70	90	170	270	10	10	10	620	560	270	2370
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**40**	**250**	**70**	**90**	**170**	**270**	**10**	**10**	**10**	**620**	**560**	**270**	**2370**

ID	Intersection Name	Volume Type	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		Final Base	20	20	40	440	20	100	10	760	220	140	900	10	2680
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**20**	**20**	**40**	**440**	**20**	**100**	**10**	**760**	**220**	**140**	**900**	**10**	**2680**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
102		Final Base	110	1040	1630	90	70	210	3150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**110**	**1040**	**1630**	**90**	**70**	**210**	**3150**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	0	110	200	0	430	430	1470	60	210	1060	390
Future Volume (veh/h)	340	0	110	200	0	430	430	1470	60	210	1060	390
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	395	0	0	233	0	0	500	1709	0	244	1233	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	429	0		300	0		585	2506		301	2086	
Arrive On Green	0.24	0.00	0.00	0.09	0.00	0.00	0.17	0.49	0.00	0.09	0.41	0.00
Sat Flow, veh/h	1781	395		3456	233		3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	395	65.0		233	71.8		500	1709	0	244	1233	0
Grp Sat Flow(s),veh/h/ln	1781	E		1728	E		1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	32.2			9.8			21.0	38.2	0.0	10.3	28.1	0.0
Cycle Q Clear(g_c), s	32.2			9.8			21.0	38.2	0.0	10.3	28.1	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	429			300			585	2506		301	2086	
V/C Ratio(X)	0.92			0.78			0.85	0.68		0.81	0.59	
Avail Cap(c_a), veh/h	830			1610			1031	3116		568	2431	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	55.2			66.7			60.1	29.1	0.0	66.9	34.4	0.0
Incr Delay (d2), s/veh	9.9			5.2			4.4	0.7	0.0	5.2	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
%ile BackOfQ(50%),veh/ln	15.7			4.6			9.6	15.8	0.0	4.8	11.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0			71.8			64.6	29.7	0.0	72.1	34.9	0.0
LnGrp LOS	E			E			E	C		E	C	
Approach Vol, veh/h								2209	A		1477	A
Approach Delay, s/veh								37.6			41.0	
Approach LOS								D			D	

Timer - Assigned Phs	1	2	3	5	6	7
Phs Duration (G+Y+Rc), s	21.5	83.2	21.4	33.8	70.9	44.5
Change Period (Y+Rc), s	8.5	10.0	8.5	8.5	10.0	8.5
Max Green Setting (Gmax), s	24.5	91.0	69.5	44.5	71.0	69.5
Max Q Clear Time (g_c+I1), s	12.3	40.2	11.8	23.0	30.1	34.2
Green Ext Time (p_c), s	0.6	33.0	1.1	2.3	19.4	1.7

Intersection Summary	
HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	0	760	150	0	100	380	540	140	50	1100	840
Future Volume (veh/h)	460	0	760	150	0	100	380	540	140	50	1100	840
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	511	0	0	167	0	0	422	600	0	56	1222	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	574	0		574	0		450	2771		93	1747	
Arrive On Green	0.17	0.00	0.00	0.17	0.00	0.00	0.34	0.72	0.00	0.05	0.34	0.00
Sat Flow, veh/h	3456	511		3456	167		1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	511	58.6		167	40.4		422	600	0	56	1222	0
Grp Sat Flow(s),veh/h/ln	1728	E		1728	D		1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	15.9			4.7			25.3	4.3	0.0	3.4	22.8	0.0
Cycle Q Clear(g_c), s	15.9			4.7			25.3	4.3	0.0	3.4	22.8	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	574			574			450	2771		93	1747	
V/C Ratio(X)	0.89			0.29			0.94	0.22		0.60	0.70	
Avail Cap(c_a), veh/h	625			625			526	2771		146	1747	
HCM Platoon Ratio	1.00			1.00			1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			0.92	0.92	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.9			40.2			35.7	7.6	0.0	51.0	31.3	0.0
Incr Delay (d2), s/veh	13.8			0.2			21.1	0.2	0.0	2.3	2.4	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9			2.0			12.8	1.5	0.0	1.6	9.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6			40.4			56.8	7.8	0.0	53.3	33.6	0.0
LnGrp LOS	E			D			E	A		D	C	
Approach Vol, veh/h								1022	A		1278	A
Approach Delay, s/veh								28.0			34.5	
Approach LOS								C			C	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	36.3	46.9	26.8		14.2	69.0	26.8
Change Period (Y+Rc), s	8.5	9.3	8.5		8.5	9.3	8.5
Max Green Setting (Gmax), s	32.5	31.3	19.9		9.0	54.8	19.9
Max Q Clear Time (g_c+I1), s	27.3	24.8	6.7		5.4	6.3	17.9
Green Ext Time (p_c), s	0.5	4.8	0.3		0.0	6.9	0.4

Intersection Summary	
HCM 6th Ctrl Delay	36.7
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	150	1170	860	630
Future Volume (veh/h)	0	0	150	1170	860	630
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1870	1870	1870	1870
Adj Flow Rate, veh/h			172	1345	989	724
Peak Hour Factor			0.87	0.87	0.87	0.87
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			272	3216	2658	1186
Arrive On Green			0.16	1.00	0.75	0.75
Sat Flow, veh/h			3456	3647	3647	1585
Grp Volume(v), veh/h			172	1345	989	724
Grp Sat Flow(s),veh/h/ln			1728	1777	1777	1585
Q Serve(g_s), s			2.8	0.0	5.8	12.7
Cycle Q Clear(g_c), s			2.8	0.0	5.8	12.7
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			272	3216	2658	1186
V/C Ratio(X)			0.63	0.42	0.37	0.61
Avail Cap(c_a), veh/h			420	3216	2658	1186
HCM Platoon Ratio			2.00	2.00	1.00	1.00
Upstream Filter(I)			0.79	0.79	0.70	0.70
Uniform Delay (d), s/veh			24.5	0.0	2.6	3.5
Incr Delay (d2), s/veh			0.7	0.3	0.3	1.7
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			1.1	0.1	1.0	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			25.2	0.3	2.9	5.2
LnGrp LOS			C	A	A	A
Approach Vol, veh/h				1517	1713	
Approach Delay, s/veh				3.1	3.9	
Approach LOS				A	A	

Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		60.0			9.4	50.6
Change Period (Y+Rc), s		5.7			* 4.7	5.7
Max Green Setting (Gmax), s		54.3			* 7.3	42.3
Max Q Clear Time (g_c+I1), s		2.0			4.8	14.7
Green Ext Time (p_c), s		4.7			0.1	18.4

Intersection Summary	
HCM 6th Ctrl Delay	3.5
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	400	170	0	1010	930	0
Future Volume (veh/h)	400	170	0	1010	930	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	0
Adj Flow Rate, veh/h	471	200	0	1188	1094	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	611	280	0	2321	2321	0
Arrive On Green	0.18	0.18	0.00	0.65	1.00	0.00
Sat Flow, veh/h	3456	1585	0	3741	3741	0
Grp Volume(v), veh/h	471	200	0	1188	1094	0
Grp Sat Flow(s),veh/h/ln	1728	1585	0	1777	1777	0
Q Serve(g_s), s	7.8	7.1	0.0	10.5	0.0	0.0
Cycle Q Clear(g_c), s	7.8	7.1	0.0	10.5	0.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	611	280	0	2321	2321	0
V/C Ratio(X)	0.77	0.71	0.00	0.51	0.47	0.00
Avail Cap(c_a), veh/h	893	409	0	2321	2321	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.59	0.94	0.00
Uniform Delay (d), s/veh	23.5	23.3	0.0	5.4	0.0	0.0
Incr Delay (d2), s/veh	1.3	1.3	0.0	0.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.6	0.0	2.7	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.8	24.5	0.0	5.9	0.6	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	671			1188	1094	
Approach Delay, s/veh	24.7			5.9	0.6	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		44.9		15.1		44.9
Change Period (Y+Rc), s		5.7		4.5		5.7
Max Green Setting (Gmax), s		34.3		15.5		34.3
Max Q Clear Time (g_c+I1), s		12.5		9.8		2.0
Green Ext Time (p_c), s		12.9		0.8		14.8

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	690	0	630	0	1820	0	0	1360	1390
Future Volume (veh/h)	0	0	0	690	0	630	0	1820	0	0	1360	1390
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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	0	1870	0	1870	0	0	1870	1870
Adj Flow Rate, veh/h				704	0	643	0	1857	0	0	1388	0
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				2	0	2	0	2	0	0	2	2
Cap, veh/h				997	0	805	0	3707	0	0	2155	
Arrive On Green				0.29	0.00	0.29	0.00	0.58	0.00	0.00	0.58	0.00
Sat Flow, veh/h				3456	0	2790	0	6958	0	0	3741	3170
Grp Volume(v), veh/h				704	0	643	0	1857	0	0	1388	0
Grp Sat Flow(s),veh/h/ln				1728	0	1395	0	1609	0	0	1870	1585
Q Serve(g_s), s				15.5	0.0	18.1	0.0	14.6	0.0	0.0	21.2	0.0
Cycle Q Clear(g_c), s				15.5	0.0	18.1	0.0	14.6	0.0	0.0	21.2	0.0
Prop In Lane				1.00		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				997	0	805	0	3707	0	0	2155	
V/C Ratio(X)				0.71	0.00	0.80	0.00	0.50	0.00	0.00	0.64	
Avail Cap(c_a), veh/h				1685	0	1360	0	5577	0	0	3242	
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				27.0	0.0	27.9	0.0	10.7	0.0	0.0	12.1	0.0
Incr Delay (d2), s/veh				0.7	0.0	1.4	0.0	0.1	0.0	0.0	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
%ile BackOfQ(50%),veh/ln				6.2	0.0	6.0	0.0	4.7	0.0	0.0	8.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.7	0.0	29.3	0.0	10.9	0.0	0.0	12.6	0.0
LnGrp LOS				C	A	C	A	B	A	A	B	
Approach Vol, veh/h					1347			1857			1388	A
Approach Delay, s/veh					28.5			10.9			12.6	
Approach LOS					C			B			B	

Timer - Assigned Phs	2		6		8			
Phs Duration (G+Y+Rc), s	54.8		54.8		30.1			
Change Period (Y+Rc), s	5.9		5.9		5.6			
Max Green Setting (Gmax), s	73.6		73.6		41.4			
Max Q Clear Time (g_c+I1), s	16.6		23.2		20.1			
Green Ext Time (p_c), s	32.3		20.8		4.4			

Intersection Summary	
HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1070	290	660	190	0	300	0	1090	80	360	1530	470
Future Volume (veh/h)	1070	290	660	190	0	300	0	1090	80	360	1530	470
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1103	299	680	196	0	309	0	1124	82	371	1577	0
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	2	2	2	0	2	0	2	2	2	2	2
Cap, veh/h	2291	1621	723	0	0	0	0	1513	110	441	2310	
Arrive On Green	0.46	0.46	0.46	0.00	0.00	0.00	0.00	0.25	0.25	0.12	0.41	0.00
Sat Flow, veh/h	5023	3554	1585		0		0	6429	448	3563	5611	1585
Grp Volume(v), veh/h	1103	299	680		0.0		0	878	328	371	1577	0
Grp Sat Flow(s),veh/h/ln	1674	1777	1585				0	1609	1790	1781	1870	1585
Q Serve(g_s), s	15.2	4.9	40.5				0.0	16.6	16.8	10.1	22.8	0.0
Cycle Q Clear(g_c), s	15.2	4.9	40.5				0.0	16.6	16.8	10.1	22.8	0.0
Prop In Lane	1.00		1.00				0.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	2291	1621	723				0	1184	439	441	2310	
V/C Ratio(X)	0.48	0.18	0.94				0.00	0.74	0.75	0.84	0.68	
Avail Cap(c_a), veh/h	2647	1872	835				0	1403	520	547	2730	
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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.8	16.0	25.7				0.0	34.5	34.5	42.4	23.9	0.0
Incr Delay (d2), s/veh	0.1	0.0	16.2				0.0	1.8	4.9	7.9	0.6	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	5.7	2.0	17.6				0.0	6.6	7.8	4.9	9.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	16.0	41.8				0.0	36.3	39.4	50.3	24.4	0.0
LnGrp LOS	B	B	D				A	D	D	D	C	
Approach Vol, veh/h		2082						1206			1948	A
Approach Delay, s/veh		25.9						37.1			29.4	
Approach LOS		C						D			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	16.5	30.6		52.0		47.1
Change Period (Y+Rc), s	* 4.2	6.3		6.8		6.3
Max Green Setting (Gmax), s	* 15	28.8		52.2		48.2
Max Q Clear Time (g_c+I1), s	12.1	18.8		42.5		24.8
Green Ext Time (p_c), s	0.2	5.5		2.7		13.0

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	300	70	10	580	670	140	50	40	860	990	20
Future Volume (veh/h)	160	300	70	10	580	670	140	50	40	860	990	20
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	316	74	11	611	705	147	53	42	905	1042	21
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	1581	800	18	1424	1138	206	112	110	1131	1160	23
Arrive On Green	0.05	0.44	0.44	0.01	0.40	0.40	0.06	0.06	0.06	0.32	0.32	0.32
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	3456	1870	1585	3563	3654	74
Grp Volume(v), veh/h	168	316	74	11	611	705	147	53	42	905	533	530
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1728	1870	1585	1781	1870	1857
Q Serve(g_s), s	6.8	7.6	3.4	0.9	17.4	31.6	5.8	3.8	3.5	32.5	38.1	38.1
Cycle Q Clear(g_c), s	6.8	7.6	3.4	0.9	17.4	31.6	5.8	3.8	3.5	32.5	38.1	38.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	188	1581	800	18	1424	1138	206	112	110	1131	594	590
V/C Ratio(X)	0.90	0.20	0.09	0.62	0.43	0.62	0.71	0.47	0.38	0.80	0.90	0.90
Avail Cap(c_a), veh/h	188	1581	800	52	1424	1138	864	468	412	1221	641	637
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	0.17	0.17	0.17	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	23.7	18.0	69.0	30.4	10.0	64.6	63.7	62.2	43.7	45.6	45.6
Incr Delay (d2), s/veh	37.1	0.3	0.2	2.2	0.2	0.4	1.7	1.2	0.8	3.2	14.1	14.2
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	4.0	3.3	1.5	0.4	7.6	25.5	2.6	1.9	1.5	14.9	20.0	19.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	102.9	24.0	18.3	71.3	30.5	10.4	66.4	64.9	63.0	46.9	59.7	59.8
LnGrp LOS	F	C	B	E	C	B	E	E	E	D	E	E
Approach Vol, veh/h		558			1327			242			1968	
Approach Delay, s/veh		47.0			20.2			65.5			53.8	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.1	62.1		14.4	5.9	68.3		51.5
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	25.9		35.0	4.1	29.4		48.0
Max Q Clear Time (g_c+I1), s	8.8	33.6		7.8	2.9	9.6		40.1
Green Ext Time (p_c), s	0.0	0.0		0.5	0.0	1.4		4.3

Intersection Summary	
HCM 6th Ctrl Delay	42.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	10	210	400	70	450	100	1270	790	0	3840	90
Future Volume (veh/h)	50	10	210	400	70	450	100	1270	790	0	3840	90
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	11	221	305	0	647	105	1181	936	0	4042	95
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	120	170	386	0	686	76	2236	1895	1	4007	94
Arrive On Green	0.06	0.06	0.06	0.22	0.00	0.22	0.04	0.60	0.60	0.00	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1781	0	3170	1781	3741	3170	1781	7718	180
Grp Volume(v), veh/h	53	11	221	305	0	647	105	1181	936	0	3168	969
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1585	1781	1870	1585	1781	1515	1838
Q Serve(g_s), s	4.0	0.8	9.0	22.7	0.0	28.1	6.0	26.0	23.6	0.0	0.0	72.7
Cycle Q Clear(g_c), s	4.0	0.8	9.0	22.7	0.0	28.1	6.0	26.0	23.6	0.0	0.0	72.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	115	120	170	386	0	686	76	2236	1895	1	3146	954
V/C Ratio(X)	0.46	0.09	1.30	0.79	0.00	0.94	1.38	0.53	0.49	0.00	1.01	1.02
Avail Cap(c_a), veh/h	115	120	170	509	0	906	76	2236	1895	64	3146	954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.69	0.69	0.69	0.00	0.32	0.32
Uniform Delay (d), s/veh	63.2	61.7	62.5	51.9	0.0	54.0	67.0	16.5	16.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.1	171.7	4.4	0.0	13.5	215.6	0.6	0.6	0.0	10.8	20.4
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	1.9	0.4	14.2	10.6	0.0	12.5	7.3	11.2	8.6	0.0	2.4	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	61.8	234.2	56.3	0.0	67.4	282.6	17.2	16.7	0.0	10.8	20.4
LnGrp LOS	E	E	F	E	A	E	F	B	B	A	F	F
Approach Vol, veh/h		285			952			2222			4137	
Approach Delay, s/veh		196.0			63.9			29.5			13.0	
Approach LOS		F			E			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	89.7		14.0	11.0	78.7		36.3
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	64.0		9.0	6.0	63.0		40.0
Max Q Clear Time (g_c+I1), s	0.0	28.0		11.0	8.0	74.7		30.1
Green Ext Time (p_c), s	0.0	2.1		0.0	0.0	0.0		0.2

Intersection Summary	
HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lake Forest GPU (Constrained PM)

Vistro File: H:\...\2040_Constrained_PM.vistro
Report File: H:\...\Constrained_PM_LOS.pdf

Scenario: Base Scenario
10/7/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1		Signalized	ICU 1	NWB Left	0.431	-	A
2		Signalized	ICU 1	SWB Left	0.617	-	B
3		Signalized	ICU 1	NWB Right	0.605	-	B
4		Signalized	ICU 1	SEB Thru	0.615	-	B
5		Signalized	ICU 1	SB Thru	0.767	-	C
6		Signalized	ICU 1	NEB Left	0.685	-	B
7		Signalized	ICU 1	NB Thru	0.462	-	A
8		Signalized	ICU 1	NB Thru	0.571	-	A
9		Signalized	ICU 1	NEB Thru	0.763	-	C
10		Signalized	ICU 1	SEB Thru	0.888	-	D
11		Signalized	ICU 1	NEB Thru	0.854	-	D
12		Signalized	ICU 1	SB Thru	0.762	-	C
13		Signalized	ICU 1	NEB Thru	0.677	-	B
14		Signalized	ICU 1	SWB Thru	0.780	-	C
15		Signalized	ICU 1	NEB Thru	0.713	-	C
16		Signalized	ICU 1	SB Thru	0.607	-	B
17		Signalized	ICU 1	SEB Thru	0.694	-	B
18		Signalized	ICU 1	NEB Thru	0.823	-	D
19		Signalized	ICU 1	EB Thru	0.690	-	B
20		Signalized	ICU 1	SEB Right	0.404	-	A
21		Signalized	ICU 1	NEB Thru	0.532	-	A
22		Signalized	ICU 1	SWB Thru	0.949	-	E
23		Signalized	ICU 1	NEB Thru	0.860	-	D
24		Signalized	ICU 1	SEB Thru	0.588	-	A
25		Signalized	ICU 1	SEB Thru	0.853	-	D
26		Signalized	ICU 1	NEB Thru	0.737	-	C
27		Signalized	ICU 1	NEB Thru	0.789	-	C
28		Signalized	ICU 1	SEB Thru	0.594	-	A
29		Signalized	ICU 1	NEB Thru	0.805	-	D
30		Signalized	ICU 1	SEB Thru	0.658	-	B
31		Signalized	ICU 1	NEB Thru	0.947	-	E
32		Signalized	ICU 1	SEB Right	0.730	-	C
33		Signalized	ICU 1	NEB Thru	0.731	-	C
34		Signalized	ICU 1	NB Thru	0.592	-	A
35		Signalized	ICU 1	EB Thru	0.618	-	B

36		Signalized	ICU 1	EB Thru	1.068	-	F
37		Signalized	ICU 1	SEB Thru	0.621	-	B
38		Signalized	ICU 1	NEB Thru	0.961	-	E
39		Signalized	ICU 1	NEB Thru	0.780	-	C
40		Signalized	ICU 1	SWB Thru	0.813	-	D
41		Signalized	ICU 1	NEB Thru	0.535	-	A
42		Signalized	ICU 1	EB Right	0.816	-	D
51		Signalized	ICU 1	EB Left	0.463	-	A
56		Signalized	ICU 1	EB Thru	0.883	-	D
57		Signalized	ICU 1	NEB Thru	0.700	-	B
60		Signalized	ICU 1	EB Thru	0.885	-	D
101		Signalized	ICU 1	NEB Thru	0.509	-	A
102		Signalized	ICU 1	NEB Thru	0.388	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.431

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	100.00	150.00	100.00	55.00	315.00	100.00	245.00	170.00	100.00	585.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	200	270	630	150	110	30	470	190	240	10	240	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.85	2.06	2.00	1.82	3.33	1.91	2.11	2.08	0.00	2.08	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	200	270	157	150	110	7	470	190	60	10	240	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	68	39	38	28	2	118	48	15	3	60	11
Total Analysis Volume [veh/h]	200	270	157	150	110	7	470	190	60	10	240	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Permis	Protect	Permis	Unsign	Protect	Permis	Unsign
Signal Group	7	4	0	3	8	8	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.08	0.00	0.09	0.03	0.00	0.14	0.04	0.00	0.00	0.07	0.00
Intersection LOS	A											
Intersection V/C	0.431											

Intersection Level Of Service Report
Intersection 2:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	190.00	100.00	180.00	285.00	100.00	285.00	230.00	100.00	100.00	230.00	100.00	220.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	230	350	350	360	250	110	410	760	100	230	650	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.17	2.00	2.00	1.94	2.00	1.82	1.95	1.97	2.00	2.17	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	350	87	360	250	27	410	760	100	230	650	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	88	22	90	63	7	103	190	25	58	163	9
Total Analysis Volume [veh/h]	230	350	87	360	250	27	410	760	100	230	650	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.10	0.05	0.21	0.07	0.02	0.12	0.17	0.17	0.07	0.13	0.02
Intersection LOS	B											
Intersection V/C	0.617											

Intersection Level Of Service Report
Intersection 3:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	195.00	100.00	295.00	110.00	100.00	425.00	300.00	100.00	100.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	270	310	460	130	290	30	320	1030	180	10	1110	220
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.85	1.94	1.96	2.31	2.07	3.33	1.88	2.04	2.22	0.00	1.98	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	310	115	130	290	7	320	1030	180	10	1110	55
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	78	29	33	73	2	80	258	45	3	278	14
Total Analysis Volume [veh/h]	270	310	115	130	290	7	320	1030	180	10	1110	55
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	122
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.09	0.07	0.08	0.09	0.00	0.09	0.24	0.24	0.00	0.22	0.03
Intersection LOS	B											
Intersection V/C	0.605											

Intersection Level Of Service Report
Intersection 4:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

Intersection Setup

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Approach	Northbound			Westbound			Northeastbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left2	Left	Thru	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	0	0	0	2	0	1
Pocket Length [ft]	200.00	100.00	100.00	215.00	100.00	345.00	100.00	100.00	100.00	515.00	100.00	185.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Base Volume Input [veh/h]	110	920	880	650	80	400	130	80	180	900	1450	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.96	2.05	2.00	2.50	2.00	2.31	2.50	2.22	2.00	2.00	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	920	220	650	80	400	130	80	180	900	1450	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	230	55	163	20	100	33	20	45	225	363	8
Total Analysis Volume [veh/h]	110	920	220	650	80	400	130	80	180	900	1450	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Protect	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	1	1	6	0	5	2	2	7	4	4
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	Lag	-	Lead	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.18	0.00	0.19	0.02	0.00	0.08	0.08	0.08	0.26	0.28	0.02
Intersection LOS	B											
Intersection V/C	0.615											

Intersection Level Of Service Report
Intersection 5:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	0	0	2	0	0	1
Pocket Length [ft]	535.00	100.00	300.00	620.00	100.00	70.00	100.00	100.00	555.00	100.00	100.00	730.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	520	1610	300	80	1200	170	130	0	200	490	0	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	1.99	2.00	2.50	2.00	1.76	2.31	0.00	2.00	2.04	0.00	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	520	1610	75	80	1200	42	130	0	50	490	0	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	130	403	19	20	300	11	33	0	13	123	0	16
Total Analysis Volume [veh/h]	520	1610	75	80	1200	42	130	0	50	490	0	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	212
Lost time [s]	11.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.32	0.00	0.02	0.24	0.00	0.04	0.00	0.00	0.29	0.00	0.00
Intersection LOS	C											
Intersection V/C	0.767											

Intersection Level Of Service Report
Intersection 6:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	2	1	0	1
Pocket Length [ft]	170.00	100.00	100.00	370.00	100.00	100.00	100.00	100.00	435.00	550.00	100.00	550.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	460	1080	60	100	680	570	50	0	60	720	0	350
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	2.04	1.67	2.00	2.06	1.93	2.00	0.00	1.67	1.94	0.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	1080	15	100	680	142	50	0	15	720	0	87
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	270	4	25	170	36	13	0	4	180	0	22
Total Analysis Volume [veh/h]	460	1080	15	100	680	142	50	0	15	720	0	87
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.27	0.21	0.00	0.06	0.13	0.00	0.01	0.00	0.00	0.21	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.685											

Intersection Level Of Service Report
Intersection 7:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.462

Intersection Setup

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Approach	Northbound		Eastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Left	Right	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	1
Pocket Length [ft]	355.00	100.00	100.00	100.00	100.00	395.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Base Volume Input [veh/h]	230	1400	0	0	1010	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.17	2.00	0.00	0.00	1.98	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	1400	0	0	1010	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	350	0	0	253	29
Total Analysis Volume [veh/h]	230	1400	0	0	1010	117
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	0	0	6	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.41	0.00	0.00	0.30	0.07
Intersection LOS	A					
Intersection V/C	0.462					

Intersection Level Of Service Report
Intersection 8:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.571

Intersection Setup

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Approach	Northbound		Southbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	655.00	365.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Base Volume Input [veh/h]	0	1380	1070	0	390	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.03	1.96	0.00	2.05	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1380	1070	0	390	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	345	268	0	98	12
Total Analysis Volume [veh/h]	0	1380	1070	0	390	47
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	0	2	6	0	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.41	0.31	0.00	0.11	0.03
Intersection LOS	A					
Intersection V/C	0.571					

Intersection Level Of Service Report
Intersection 9:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	1
Pocket Length [ft]	100.00	230.00	390.00	100.00	185.00	145.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Base Volume Input [veh/h]	1130	900	420	810	440	350
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.04	2.00	1.90	1.98	2.05	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1130	225	420	810	440	87
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	283	56	105	203	110	22
Total Analysis Volume [veh/h]	1130	225	420	810	440	87
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.33	0.13	0.25	0.24	0.13	0.03
Intersection LOS	C					
Intersection V/C	0.763					

Intersection Level Of Service Report
Intersection 10:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.888

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	340.00	100.00	200.00	250.00	100.00	110.00	245.00	100.00	215.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Base Volume Input [veh/h]	310	780	200	150	920	320	270	530	170	240	1040	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	2.05	2.00	2.00	1.96	1.88	1.85	2.08	1.76	2.08	2.02	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	310	780	50	150	920	80	270	530	42	240	1040	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	195	13	38	230	20	68	133	11	60	260	6
Total Analysis Volume [veh/h]	310	780	50	150	920	80	270	530	42	240	1040	22
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.23	0.03	0.09	0.27	0.05	0.08	0.16	0.02	0.14	0.31	0.01
Intersection LOS	D											
Intersection V/C	0.888											

Intersection Level Of Service Report
Intersection 11:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	190.00	100.00	190.00	190.00	100.00	80.00	100.00	100.00	100.00	190.00	100.00	180.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Base Volume Input [veh/h]	400	1690	120	80	1090	180	300	260	150	420	40	490
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.01	1.67	2.50	2.02	2.22	2.00	1.92	2.00	1.90	2.50	2.04
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	400	1690	30	80	1090	45	300	260	150	420	40	490
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	100	423	8	20	273	11	75	65	38	105	10	123
Total Analysis Volume [veh/h]	400	1690	30	80	1090	45	300	260	150	420	40	490
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.24	0.50	0.02	0.05	0.32	0.03	0.09	0.12	0.12	0.12	0.16	0.16
Intersection LOS	D											
Intersection V/C	0.854											

Intersection Level Of Service Report
Intersection 12:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

Intersection Setup

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	1	0	2
Pocket Length [ft]	400.00	100.00	100.00	200.00	100.00	100.00	395.00	100.00	260.00	150.00	100.00	170.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Base Volume Input [veh/h]	330	1160	50	460	2140	690	510	550	480	10	210	230
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.12	1.98	2.00	1.96	2.01	2.03	1.96	2.00	2.08	0.00	1.90	2.17
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	330	1160	50	460	2140	172	510	550	120	10	210	57
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	83	290	13	115	535	43	128	138	30	3	53	14
Total Analysis Volume [veh/h]	330	1160	50	460	2140	172	510	550	120	10	210	57
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.18	0.18	0.14	0.42	0.10	0.15	0.11	0.07	0.01	0.04	0.02
Intersection LOS	C											
Intersection V/C	0.762											

Intersection Level Of Service Report
Intersection 13:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.677

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Thru	Right	Right2	Left2	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	0
Pocket Length [ft]	285.00	100.00	180.00	285.00	100.00	220.00	345.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Base Volume Input [veh/h]	10	1150	270	230	1620	400	590	400	30	160	260	220
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	1.85	2.17	1.98	2.00	2.03	2.00	3.33	1.88	1.92	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	1150	67	230	1620	100	590	400	30	160	260	220
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	288	17	58	405	25	148	100	8	40	65	55
Total Analysis Volume [veh/h]	10	1150	67	230	1620	100	590	400	30	160	260	220
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	131
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Permis	Protect	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.34	0.04	0.14	0.48	0.06	0.17	0.25	0.25	0.09	0.08	0.14
Intersection LOS	B											
Intersection V/C	0.677											

Intersection Level Of Service Report
Intersection 14:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	2	2	0	1
Pocket Length [ft]	305.00	100.00	155.00	305.00	100.00	150.00	305.00	100.00	225.00	275.00	100.00	275.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Base Volume Input [veh/h]	130	2000	700	410	2010	200	300	340	200	290	640	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.31	2.00	2.00	1.95	1.99	2.00	2.00	2.06	2.00	2.07	2.03	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	2000	175	410	2010	50	300	340	12	290	640	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	500	44	103	503	13	75	85	3	73	160	25
Total Analysis Volume [veh/h]	130	2000	175	410	2010	50	300	340	12	290	640	100
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.39	0.10	0.12	0.39	0.03	0.09	0.05	0.01	0.09	0.13	0.06
Intersection LOS	C											
Intersection V/C	0.780											

Intersection Level Of Service Report
Intersection 15:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.713

Intersection Setup

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Approach	Northbound			Northeastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	0	2	0	1
Pocket Length [ft]	210.00	100.00	280.00	275.00	100.00	405.00	160.00	100.00	100.00	175.00	100.00	225.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Base Volume Input [veh/h]	280	560	350	280	1340	520	380	1140	190	480	1050	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	1.96	2.00	2.14	2.01	1.92	2.11	2.02	2.11	2.08	2.00	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	280	560	87	280	1340	130	380	1140	190	480	1050	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	140	22	70	335	33	95	285	48	120	263	11
Total Analysis Volume [veh/h]	280	560	87	280	1340	130	380	1140	190	480	1050	42
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	5	2	2	1	6	6	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.11	0.05	0.08	0.26	0.08	0.11	0.26	0.26	0.14	0.21	0.02
Intersection LOS	C											
Intersection V/C	0.713											

Intersection Level Of Service Report
Intersection 16:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

Intersection Setup

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Approach	Southbound		Northeastbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	0	0	1	0
Pocket Length [ft]	100.00	200.00	100.00	100.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Base Volume Input [veh/h]	1730	280	210	380	160	940
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.02	2.14	1.90	2.11	1.88	2.02
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1730	70	210	95	160	940
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	433	18	53	24	40	235
Total Analysis Volume [veh/h]	1730	70	210	95	160	940
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Split	Split	Protected	Permissive
Signal Group	4	4	2	2	3	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lag	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.34	0.04	0.12	0.06	0.09	0.18
Intersection LOS	B					
Intersection V/C	0.607					

Intersection Level Of Service Report
Intersection 17:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	360.00	100.00	305.00	165.00	100.00	175.00	225.00	100.00	230.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Base Volume Input [veh/h]	300	1250	340	310	1020	280	120	490	260	470	1090	280
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.06	1.94	1.96	2.14	1.67	2.04	1.92	1.91	2.02	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	300	1250	85	310	1020	70	120	490	65	470	1090	280
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	313	21	78	255	18	30	123	16	118	273	70
Total Analysis Volume [veh/h]	300	1250	85	310	1020	70	120	490	65	470	1090	280
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3			6,7						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.25	0.01	0.09	0.20	0.00	0.04	0.10	0.04	0.14	0.27	0.27
Intersection LOS	B											
Intersection V/C	0.694											

Intersection Level Of Service Report
Intersection 18:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.823

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	180.00	100.00	205.00	205.00	100.00	225.00	285.00	100.00	100.00	205.00	100.00	110.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	110	2500	430	110	2490	30	60	110	100	230	610	360
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	2.00	2.09	1.82	2.01	3.33	1.67	1.82	2.00	2.17	1.97	1.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	2500	107	110	2490	7	60	110	100	230	610	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	625	27	28	623	2	15	28	25	58	153	23
Total Analysis Volume [veh/h]	110	2500	107	110	2490	7	60	110	100	230	610	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.49	0.06	0.06	0.49	0.00	0.04	0.06	0.06	0.07	0.18	0.05
Intersection LOS	D											
Intersection V/C	0.823											

Intersection Level Of Service Report
Intersection 19:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Approach	Eastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	185.00	180.00	100.00	200.00	155.00	100.00	100.00	135.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	140	1930	180	40	1280	30	70	70	20	140	530	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.02	2.22	2.50	2.03	3.33	1.43	1.43	0.00	2.14	2.08	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	1930	45	40	1280	7	70	70	20	140	530	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	483	11	10	320	2	18	18	5	35	133	35
Total Analysis Volume [veh/h]	140	1930	45	40	1280	7	70	70	20	140	530	140
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.38	0.03	0.02	0.25	0.00	0.04	0.03	0.03	0.08	0.20	0.20
Intersection LOS	B											
Intersection V/C	0.690											

Intersection Level Of Service Report
Intersection 20:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.404

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	110.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	30	380	50	90	350	30	50	110	50	130	460	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	2.11	2.00	2.22	2.00	3.33	2.00	1.82	2.00	2.31	1.96	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	380	50	90	350	30	50	110	50	130	460	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	95	13	23	88	8	13	28	13	33	115	8
Total Analysis Volume [veh/h]	30	380	50	90	350	30	50	110	50	130	460	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	157
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.13	0.13	0.05	0.11	0.11	0.03	0.05	0.05	0.08	0.14	0.14
Intersection LOS	A											
Intersection V/C	0.404											

Intersection Level Of Service Report
Intersection 21:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	250.00	100.00	250.00	210.00	100.00	1000.0	100.00	100.00	25.00	170.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	90	1690	30	20	1170	90	10	20	20	320	80	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.22	2.01	3.33	0.00	1.97	2.22	0.00	0.00	0.00	1.88	2.50	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1690	7	20	1170	22	10	20	5	320	80	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	423	2	5	293	6	3	5	1	80	20	10
Total Analysis Volume [veh/h]	90	1690	7	20	1170	22	10	20	5	320	80	40
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.33	0.00	0.01	0.23	0.01	0.01	0.02	0.00	0.09	0.12	0.02
Intersection LOS	A											
Intersection V/C	0.532											

Intersection Level Of Service Report
Intersection 22:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.949

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	350.00	100.00	190.00	285.00	100.00	200.00	255.00	100.00	100.00	150.00	100.00	80.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	40	2720	550	210	2720	50	140	140	90	220	530	450
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	1.99	2.00	1.90	1.99	2.00	2.14	2.14	2.22	1.82	2.08	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	2720	137	210	2720	12	140	140	90	220	530	112
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	680	34	53	680	3	35	35	23	55	133	28
Total Analysis Volume [veh/h]	40	2720	137	210	2720	12	140	140	90	220	530	112
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	131
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.53	0.08	0.12	0.53	0.01	0.08	0.07	0.07	0.06	0.16	0.07
Intersection LOS	E											
Intersection V/C	0.949											

Intersection Level Of Service Report
Intersection 23:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.860

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	195.00	100.00	300.00	255.00	100.00	275.00	240.00	100.00	100.00	190.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	180	1210	130	110	1910	300	110	270	90	350	900	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.22	1.98	2.31	1.82	1.99	2.00	1.82	1.85	2.22	2.00	2.00	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	180	1210	32	110	1910	75	110	270	90	350	900	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	45	303	8	28	478	19	28	68	23	88	225	8
Total Analysis Volume [veh/h]	180	1210	32	110	1910	75	110	270	90	350	900	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.24	0.02	0.06	0.37	0.04	0.06	0.11	0.11	0.21	0.26	0.02
Intersection LOS	D											
Intersection V/C	0.860											

Intersection Level Of Service Report
Intersection 24:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.588

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	115.00	175.00	100.00	95.00	95.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	60	370	40	130	310	20	60	400	50	100	990	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	1.89	2.50	2.31	1.94	0.00	1.67	2.00	2.00	2.00	2.02	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	370	10	130	310	5	60	400	50	100	990	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	93	3	33	78	1	15	100	13	25	248	23
Total Analysis Volume [veh/h]	60	370	10	130	310	5	60	400	50	100	990	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.11	0.01	0.08	0.09	0.00	0.04	0.13	0.13	0.06	0.32	0.32
Intersection LOS	A											
Intersection V/C	0.588											

Intersection Level Of Service Report
Intersection 25:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.853

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	1	0	0
Pocket Length [ft]	195.00	100.00	125.00	360.00	100.00	575.00	155.00	100.00	145.00	180.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	140	1620	440	210	980	30	340	420	210	30	980	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	1.98	2.05	1.90	2.04	3.33	2.06	1.90	1.90	3.33	2.04	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	1620	110	210	980	7	340	420	52	30	980	110
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	405	28	53	245	2	85	105	13	8	245	28
Total Analysis Volume [veh/h]	140	1620	110	210	980	7	340	420	52	30	980	110
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.32	0.00	0.06	0.19	0.00	0.10	0.12	0.03	0.02	0.32	0.32
Intersection LOS	D											
Intersection V/C	0.853											

Intersection Level Of Service Report
Intersection 26:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.737

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	285.00	100.00	100.00	295.00	100.00	110.00	180.00	100.00	175.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	260	1280	340	190	640	170	360	500	190	420	730	270
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	2.03	2.06	2.11	2.03	1.76	1.94	2.00	2.11	1.90	2.05	1.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	1280	85	190	640	42	360	500	47	420	730	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	320	21	48	160	11	90	125	12	105	183	17
Total Analysis Volume [veh/h]	260	1280	85	190	640	42	360	500	47	420	730	67
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.25	0.05	0.11	0.13	0.02	0.11	0.15	0.03	0.12	0.21	0.04
Intersection LOS	C											
Intersection V/C	0.737											

Intersection Level Of Service Report
Intersection 27:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	295.00	100.00	285.00	235.00	100.00	290.00	245.00	100.00	210.00	185.00	100.00	255.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	10	1850	540	240	1210	50	210	240	180	280	830	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.04	2.08	1.98	2.00	1.90	2.08	2.22	2.14	2.05	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	1850	135	240	1210	12	210	240	45	280	830	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	463	34	60	303	3	53	60	11	70	208	8
Total Analysis Volume [veh/h]	10	1850	135	240	1210	12	210	240	45	280	830	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.36	0.08	0.07	0.24	0.01	0.06	0.07	0.03	0.08	0.24	0.01
Intersection LOS	C											
Intersection V/C	0.789											

Intersection Level Of Service Report
Intersection 28:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.594

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	185.00	100.00	190.00	175.00	100.00	200.00	180.00	100.00	95.00	300.00	100.00	125.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	140	230	160	210	220	100	40	430	170	170	1120	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.17	1.88	1.90	1.82	2.00	2.50	2.09	1.76	1.76	1.96	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	230	40	210	220	25	40	430	42	170	1120	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	58	10	53	55	6	10	108	11	43	280	7
Total Analysis Volume [veh/h]	140	230	40	210	220	25	40	430	42	170	1120	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.07	0.02	0.12	0.06	0.01	0.02	0.13	0.02	0.10	0.33	0.02
Intersection LOS	A											
Intersection V/C	0.594											

Intersection Level Of Service Report
Intersection 29:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.805

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	245.00	100.00	100.00	150.00	100.00	345.00	215.00	100.00	120.00	170.00	100.00	295.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	270	1810	360	80	1160	110	310	330	200	190	960	420
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.85	1.99	1.94	2.50	1.98	1.82	1.94	2.12	2.00	2.11	1.98	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	1810	90	80	1160	27	310	330	50	190	960	105
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	453	23	20	290	7	78	83	13	48	240	26
Total Analysis Volume [veh/h]	270	1810	90	80	1160	27	310	330	50	190	960	105
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.35	0.05	0.02	0.23	0.02	0.09	0.10	0.03	0.06	0.28	0.06
Intersection LOS	D											
Intersection V/C	0.805											

Intersection Level Of Service Report
Intersection 30:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	210.00	100.00	410.00	190.00	100.00	125.00	250.00	100.00	145.00	305.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	150	1250	270	270	770	170	100	480	220	410	640	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	1.85	1.85	1.95	1.76	2.00	2.08	1.82	1.95	2.03	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	1250	67	270	770	42	100	480	220	410	640	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	313	17	68	193	11	25	120	55	103	160	53
Total Analysis Volume [veh/h]	150	1250	67	270	770	42	100	480	220	410	640	210
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.25	0.04	0.08	0.15	0.02	0.03	0.14	0.13	0.12	0.25	0.25
Intersection LOS	B											
Intersection V/C	0.658											

Intersection Level Of Service Report
Intersection 31:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.947

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	1	2	0	1	2	0	2
Pocket Length [ft]	225.00	100.00	290.00	165.00	100.00	180.00	260.00	100.00	155.00	145.00	100.00	250.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	410	2370	680	380	1440	220	390	330	320	430	460	510
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.95	1.98	2.06	2.11	2.01	1.82	2.05	2.12	1.88	2.09	1.96	1.96
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	410	2370	170	380	1440	220	390	330	80	430	460	127
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	103	593	43	95	360	55	98	83	20	108	115	32
Total Analysis Volume [veh/h]	410	2370	170	380	1440	220	390	330	80	430	460	127
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.46	0.10	0.11	0.24	0.24	0.08	0.19	0.05	0.13	0.14	0.00
Intersection LOS	E											
Intersection V/C	0.947											

Intersection Level Of Service Report
Intersection 32:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	155.00	100.00	100.00	100.00	170.00	100.00	100.00	255.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	70	60	50	120	70	160	50	570	140	550	1310	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.43	1.67	2.00	1.67	1.43	1.88	2.00	1.93	2.14	2.00	1.98	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	60	12	120	70	160	50	570	140	550	1310	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	15	3	30	18	40	13	143	35	138	328	23
Total Analysis Volume [veh/h]	70	60	12	120	70	160	50	570	140	550	1310	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	5	5	6	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.04	0.01	0.07	0.10	0.10	0.03	0.21	0.21	0.32	0.41	0.41
Intersection LOS	C											
Intersection V/C	0.730											

Intersection Level Of Service Report
Intersection 33:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	2	0	1	2	0	1
Pocket Length [ft]	250.00	100.00	235.00	200.00	100.00	100.00	195.00	100.00	200.00	245.00	100.00	155.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	740	2280	630	260	1420	70	530	200	130	110	290	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	2.02	2.06	1.92	1.97	1.43	2.08	2.00	2.31	1.82	2.07	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	740	2280	157	260	1420	70	530	200	32	110	290	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	185	570	39	65	355	18	133	50	8	28	73	29
Total Analysis Volume [veh/h]	740	2280	157	260	1420	70	530	200	32	110	290	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Unsign
Signal Group	5	2	2	1	6	6	3	8	8	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.34	0.09	0.08	0.22	0.22	0.16	0.06	0.02	0.03	0.09	0.00
Intersection LOS	C											
Intersection V/C	0.731											

Intersection Level Of Service Report
Intersection 34:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.592

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	160.00	100.00	160.00	100.00	100.00	50.00	250.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	250	1040	10	20	690	250	10	30	20	550	30	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.02	0.00	0.00	2.03	2.00	0.00	3.33	0.00	2.00	3.33	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	250	1040	10	20	690	62	10	30	20	550	30	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	260	3	5	173	16	3	8	5	138	8	16
Total Analysis Volume [veh/h]	250	1040	10	20	690	62	10	30	20	550	30	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.31	0.31	0.01	0.20	0.04	0.01	0.02	0.02	0.16	0.17	0.04
Intersection LOS	A											
Intersection V/C	0.592											

Intersection Level Of Service Report
Intersection 35:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.618

Intersection Setup

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Approach	Northbound			Eastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	640.00	100.00	640.00	190.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Base Volume Input [veh/h]	360	0	780	0	3160	0	0	1290	1090	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	0.00	2.05	0.00	1.99	0.00	0.00	2.02	2.02	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	360	0	195	0	3160	0	0	1290	272	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	0	49	0	790	0	0	323	68	0	0	0
Total Analysis Volume [veh/h]	360	0	195	0	3160	0	0	1290	272	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	8	0	8	0	2	0	0	6	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.00	0.06	0.00	0.46	0.00	0.00	0.25	0.16	0.00	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.618											

Intersection Level Of Service Report
Intersection 36:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.068

Intersection Setup

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	125.00	100.00	125.00	100.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	465.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	170	0	460	1990	470	610	0	2500	170	350	870	620
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	0.00	1.96	2.01	1.91	1.97	0.00	2.00	1.76	2.00	1.95	1.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	0	460	1990	470	152	0	2500	170	350	870	155
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	0	115	498	118	38	0	625	43	88	218	39
Total Analysis Volume [veh/h]	170	0	460	1990	470	152	0	2500	170	350	870	155
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Permis	Permis	Permis	Protect	Permis	Permis
Signal Group	8	0	8	4	4	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	-	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.14	0.39	0.14	0.09	0.00	0.39	0.39	0.10	0.17	0.09
Intersection LOS	F											
Intersection V/C	1.068											

Intersection Level Of Service Report
Intersection 37:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.621

Intersection Setup

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	2	1	0	1	2	0	1
Pocket Length [ft]	145.00	100.00	100.00	100.00	100.00	265.00	35.00	100.00	120.00	135.00	100.00	45.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	80	100	110	1240	430	30	20	480	610	220	960	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	2.00	1.82	2.02	2.09	3.33	0.00	2.08	1.97	1.82	1.98	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	100	27	1240	430	30	20	480	152	220	960	340
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	25	7	310	108	8	5	120	38	55	240	85
Total Analysis Volume [veh/h]	80	100	27	1240	430	30	20	480	152	220	960	340
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Protect	Permis	Protect	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	8	1	6	6
Auxiliary Signal Groups			4,5									
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.06	0.00	0.24	0.25	0.25	0.01	0.14	0.09	0.06	0.28	0.20
Intersection LOS	B											
Intersection V/C	0.621											

Intersection Level Of Service Report
Intersection 38:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.961

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	1
Pocket Length [ft]	110.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	410.00	165.00	100.00	165.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Base Volume Input [veh/h]	100	2860	900	0	2400	110	500	70	810	130	10	280
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.99	2.00	0.00	2.00	1.82	2.00	1.43	1.98	2.31	0.00	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	2860	225	0	2400	110	500	70	810	130	10	280
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	715	56	0	600	28	125	18	203	33	3	70
Total Analysis Volume [veh/h]	100	2860	225	0	2400	110	500	70	810	130	10	280
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.56	0.13	0.00	0.30	0.30	0.15	0.27	0.27	0.08	0.01	0.11
Intersection LOS	E											
Intersection V/C	0.961											

Intersection Level Of Service Report
Intersection 39:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	2	0	1	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	305.00	100.00	135.00	215.00	100.00	100.00	215.00	100.00	90.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	0	2310	50	290	1180	870	60	180	580	1520	740	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.99	2.00	2.07	2.03	1.95	1.67	2.22	2.07	1.97	2.03	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	2310	50	290	1180	217	60	180	145	1520	740	5
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	578	13	73	295	54	15	45	36	380	185	1
Total Analysis Volume [veh/h]	0	2310	50	290	1180	217	60	180	145	1520	740	5
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Protect	Permis	Permis	Permis	Permis	Overla	Split	Split	Split
Signal Group	0	2	2	1	6	6	8	8	1	4	4	4
Auxiliary Signal Groups									1,8			
Lead / Lag	-	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.35	0.35	0.09	0.23	0.13	0.04	0.14	0.00	0.30	0.22	0.00
Intersection LOS	C											
Intersection V/C	0.780											

Intersection Level Of Service Report
Intersection 40:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.813

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	0	0	1	1	0	0
Pocket Length [ft]	295.00	100.00	195.00	135.00	100.00	100.00	100.00	100.00	95.00	165.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Base Volume Input [veh/h]	720	1120	10	30	1640	220	20	30	30	350	60	1530
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	1.96	0.00	3.33	2.01	1.82	0.00	3.33	3.33	2.00	1.67	2.03
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	720	1120	2	30	1640	55	20	30	7	350	60	382
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	180	280	1	8	410	14	5	8	2	88	15	96
Total Analysis Volume [veh/h]	720	1120	2	30	1640	55	20	30	7	350	60	382
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	182
Lost time [s]	9.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Protect	Permis	Permis	Permis	Split	Split	Split
Signal Group	5	2	2	1	6	4	8	8	1	4	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.22	0.00	0.01	0.32	0.03	0.01	0.01	0.00	0.10	0.12	0.22
Intersection LOS	D											
Intersection V/C	0.813											

Intersection Level Of Service Report
Intersection 41:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.535

Intersection Setup

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Approach	Southbound			Northeastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	200.00	100.00	205.00	225.00	100.00	230.00	260.00	100.00	155.00	245.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Base Volume Input [veh/h]	30	80	150	150	1540	160	50	870	50	240	70	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	2.50	2.00	2.00	2.01	1.88	2.00	1.95	2.00	2.08	1.43	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	80	37	150	1540	40	50	870	12	240	70	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	20	9	38	385	10	13	218	3	60	18	11
Total Analysis Volume [veh/h]	30	80	37	150	1540	40	50	870	12	240	70	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	111
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	7	4	4	5	2	2	1	6	6	3	8	8
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.02	0.02	0.09	0.30	0.02	0.01	0.17	0.01	0.14	0.02	0.03
Intersection LOS	A											
Intersection V/C	0.535											

Intersection Level Of Service Report
Intersection 42:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

Intersection Setup

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Approach	Eastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	2	0
Pocket Length [ft]	100.00	100.00	305.00	100.00	260.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Base Volume Input [veh/h]	1710	480	100	1070	930	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.99	2.08	2.00	1.96	2.04	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1710	480	100	1070	930	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	428	120	25	268	233	21
Total Analysis Volume [veh/h]	1710	480	100	1070	930	85
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	8	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.43	0.43	0.06	0.21	0.27	0.05
Intersection LOS	D					
Intersection V/C	0.816					

Intersection Level Of Service Report
Intersection 51:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.463

Intersection Setup

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Approach	Eastbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	255.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Base Volume Input [veh/h]	360	140	130	870	560	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	2.14	2.31	1.95	1.96	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	360	35	130	870	560	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	9	33	218	140	23
Total Analysis Volume [veh/h]	360	35	130	870	560	90
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	7	5	5	2	6	6
Auxiliary Signal Groups		5				
Lead / Lag	Lag	-	Lead	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.00	0.08	0.17	0.13	0.13
Intersection LOS	A					
Intersection V/C	0.463					

Intersection Level Of Service Report
Intersection 56:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.883

Intersection Setup

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Approach	Northbound			Southbound			Eastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	2	1	0	1	1	0	1
Pocket Length [ft]	170.00	100.00	170.00	100.00	100.00	165.00	290.00	100.00	225.00	295.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Base Volume Input [veh/h]	220	200	410	30	70	50	190	1520	160	420	1060	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	2.00	1.95	3.33	1.43	2.00	2.11	1.97	1.88	1.90	1.98	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	200	102	30	70	12	190	1520	40	420	1060	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	50	26	8	18	3	48	380	10	105	265	10
Total Analysis Volume [veh/h]	220	200	102	30	70	12	190	1520	40	420	1060	40
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	131
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.12	0.06	0.02	0.04	0.01	0.11	0.45	0.02	0.25	0.31	0.02
Intersection LOS	D											
Intersection V/C	0.883											

Intersection Level Of Service Report
Intersection 57:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	140.00	100.00	175.00	105.00	100.00	200.00	100.00	100.00	35.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Base Volume Input [veh/h]	340	870	30	60	770	420	30	10	20	680	20	330
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.06	1.95	3.33	1.67	1.95	1.90	3.33	0.00	0.00	2.06	0.00	2.12
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	340	870	7	60	770	105	30	10	20	680	20	82
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	85	218	2	15	193	26	8	3	5	170	5	21
Total Analysis Volume [veh/h]	340	870	7	60	770	105	30	10	20	680	20	82
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.26	0.00	0.04	0.23	0.06	0.02	0.02	0.02	0.20	0.21	0.05
Intersection LOS	B											
Intersection V/C	0.700											

Intersection Level Of Service Report
Intersection 60:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Approach	Southbound			Eastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left2	Left	Right	Left2	Left	Thru	Left	Thru	Right	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	210.00	100.00	100.00	140.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Base Volume Input [veh/h]	30	660	110	160	10	740	300	220	40	290	390	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	1.97	1.82	1.88	0.00	2.03	2.00	1.82	2.50	2.07	2.05	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	660	110	160	10	740	300	220	40	290	390	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	165	28	40	3	185	75	55	10	73	98	5
Total Analysis Volume [veh/h]	30	660	110	160	10	740	300	220	40	290	390	20
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	129
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis
Signal Group	1	6	6	4	4	4	8	8	8	5	2	2
Auxiliary Signal Groups												
Lead / Lag	Lead	Lag	-	Lag	Lag	-	Lag	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.23	0.09	0.01	0.44	0.18	0.15	0.15	0.17	0.12	0.12
Intersection LOS	D											
Intersection V/C	0.885											

Intersection Level Of Service Report
Intersection 101:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.509

Intersection Setup

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Approach	Eastbound			Westbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	1
Pocket Length [ft]	65.00	100.00	100.00	60.00	100.00	100.00	150.00	100.00	190.00	155.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	20	10	10	100	20	110	30	1100	400	80	970	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	2.00	0.00	1.82	3.33	2.00	2.00	2.50	1.96	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	10	10	100	20	110	30	1100	100	80	970	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	3	25	5	28	8	275	25	20	243	2
Total Analysis Volume [veh/h]	20	10	10	100	20	110	30	1100	100	80	970	7
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.06	0.08	0.08	0.02	0.32	0.06	0.05	0.29	0.00
Intersection LOS	A											
Intersection V/C	0.509											

Intersection Level Of Service Report
Intersection 102:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.388

Intersection Setup

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Base Volume Input [veh/h]	110	1620	1130	40	40	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.98	2.04	2.50	2.50	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1620	1130	40	40	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	405	283	10	10	4
Total Analysis Volume [veh/h]	110	1620	1130	40	40	17
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Overlap
Signal Group	5	2	6	6	7	5
Auxiliary Signal Groups						5
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.32	0.23	0.23	0.02	0.00
Intersection LOS	A					
Intersection V/C	0.388					

Lake Forest GPU (Constrained PM)

Vistro File: H:\...\2040_Constrained_PM.vistro
Report File: H:\...\Constrained_PM_LOS.pdf

Scenario: Base Scenario
10/7/2019

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		200	270	630	150	110	30	470	190	240	10	240	180	2720

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		230	350	350	360	250	110	410	760	100	230	650	150	3950

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		270	310	460	130	290	30	320	1030	180	10	1110	220	4360

ID	Intersection Name	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
		Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		110	920	880	650	80	400	130	80	180	900	1450	120	5900

ID	Intersection Name	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		520	1610	300	80	1200	170	130	200	490	260	4960

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		460	1080	60	100	680	570	50	60	720	350	4130

ID	Intersection Name	Northbound		Southwestbound		Total Volume
		Left	Thru	Thru	Right	
7		230	1400	1010	470	3110

ID	Intersection Name	Northbound	Southbound	Southeastbound		Total Volume
		Thru	Thru	Left	Right	
8		1380	1070	390	190	3030

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
9		1130	900	420	810	440	350	4050

ID	Intersection Name	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		310	780	200	150	920	320	270	530	170	240	1040	90	5020

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		400	1690	120	80	1090	180	300	260	150	420	40	490	5220

ID	Intersection Name	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		330	1160	50	460	2140	690	510	550	480	10	210	230	6820

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		10	1150	270	230	1620	400	590	400	30	160	260	220	5340

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		130	2000	700	410	2010	200	300	340	200	290	640	250	7470

ID	Intersection Name	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		280	560	350	280	1340	520	380	1140	190	480	1050	170	6740

ID	Intersection Name	Southbound		Northeastbound		Northwestbound		Total Volume
		Thru	Right	Left	Right	Left	Thru	
16		1730	280	210	380	160	940	3700

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		300	1250	340	310	1020	280	120	490	260	470	1090	280	6210

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		110	2500	430	110	2490	30	60	110	100	230	610	360	7140

ID	Intersection Name	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		140	1930	180	40	1280	30	70	70	20	140	530	140	4570

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		30	380	50	90	350	30	50	110	50	130	460	30	1760

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		90	1690	30	20	1170	90	10	20	20	320	80	160	3700

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		40	2720	550	210	2720	50	140	140	90	220	530	450	7860

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		180	1210	130	110	1910	300	110	270	90	350	900	120	5680

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		60	370	40	130	310	20	60	400	50	100	990	90	2620

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		140	1620	440	210	980	30	340	420	210	30	980	110	5510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		260	1280	340	190	640	170	360	500	190	420	730	270	5350

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		10	1850	540	240	1210	50	210	240	180	280	830	120	5760

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		140	230	160	210	220	100	40	430	170	170	1120	110	3100

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		270	1810	360	80	1160	110	310	330	200	190	960	420	6200

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		150	1250	270	270	770	170	100	480	220	410	640	210	4940

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		410	2370	680	380	1440	220	390	330	320	430	460	510	7940

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		70	60	50	120	70	160	50	570	140	550	1310	90	3240

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		740	2280	630	260	1420	70	530	200	130	110	290	470	7130

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		250	1040	10	20	690	250	10	30	20	550	30	260	3160

ID	Intersection Name	Northbound		Eastbound	Southwestbound		Total Volume
		Left	Right	Thru	Thru	Right	
35		360	780	3160	1290	1090	6680

ID	Intersection Name	Northbound		Southbound			Eastbound		Westbound			Total Volume
		Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		170	460	1990	470	610	2500	170	350	870	620	8210

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		80	100	110	1240	430	30	20	480	610	220	960	340	4620

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		100	2860	900	0	2400	110	500	70	810	130	10	280	8170

ID	Intersection Name	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
		Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		2310	50	290	1180	870	60	180	580	1520	740	20	7800

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		720	1120	10	30	1640	220	20	30	30	350	60	1530	5760

ID	Intersection Name	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		30	80	150	150	1540	160	50	870	50	240	70	180	3570

ID	Intersection Name	Eastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
42		1710	480	100	1070	930	340	4630

ID	Intersection Name	Eastbound		Northeastbound		Southwestbound		Total Volume
		Left	Right	Left	Thru	Thru	Right	
51		360	140	130	870	560	90	2150

ID	Intersection Name	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		220	200	410	30	70	50	190	1520	160	420	1060	160	4490

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		340	870	30	60	770	420	30	10	20	680	20	330	3580

ID	Intersection Name	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
		2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		30	660	110	160	10	740	300	220	40	290	390	20	2970

ID	Intersection Name	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		20	10	10	100	20	110	30	1100	400	80	970	30	2880

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
102		110	1620	1130	40	40	70	3010

Lake Forest GPU (Constrained PM)

Vistro File: H:\...\2040_Constrained_PM.vistro
Report File: H:\...\Constrained_PM_LOS.pdf

Scenario: Base Scenario
10/7/2019

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		Final Base	200	270	630	150	110	30	470	190	240	10	240	180	2720
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**200**	**270**	**630**	**150**	**110**	**30**	**470**	**190**	**240**	**10**	**240**	**180**	**2720**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		Final Base	230	350	350	360	250	110	410	760	100	230	650	150	3950
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**230**	**350**	**350**	**360**	**250**	**110**	**410**	**760**	**100**	**230**	**650**	**150**	**3950**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		Final Base	270	310	460	130	290	30	320	1030	180	10	1110	220	4360
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**270**	**310**	**460**	**130**	**290**	**30**	**320**	**1030**	**180**	**10**	**1110**	**220**	**4360**

ID	Intersection Name	Volume Type	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
			Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		Final Base	110	920	880	650	80	400	130	80	180	900	1450	120	5900
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**920**	**880**	**650**	**80**	**400**	**130**	**80**	**180**	**900**	**1450**	**120**	**5900**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		Final Base	520	1610	300	80	1200	170	130	200	490	260	4960
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**520**	**1610**	**300**	**80**	**1200**	**170**	**130**	**200**	**490**	**260**	**4960**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		Final Base	460	1080	60	100	680	570	50	60	720	350	4130
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**460**	**1080**	**60**	**100**	**680**	**570**	**50**	**60**	**720**	**350**	**4130**

ID	Intersection Name	Volume Type	Northbound		Southwestbound		Total Volume
			Left	Thru	Thru	Right	
7		Final Base	230	1400	1010	470	3110
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**230**	**1400**	**1010**	**470**	**3110**

ID	Intersection Name	Volume Type	Northbound	Southbound	Southeastbound		Total Volume
			Thru	Thru	Left	Right	
8		Final Base	1380	1070	390	190	3030
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**1380**	**1070**	**390**	**190**	**3030**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
9		Final Base	1130	900	420	810	440	350	4050
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1130**	**900**	**420**	**810**	**440**	**350**	**4050**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		Final Base	310	780	200	150	920	320	270	530	170	240	1040	90	5020
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**310**	**780**	**200**	**150**	**920**	**320**	**270**	**530**	**170**	**240**	**1040**	**90**	**5020**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		Final Base	400	1690	120	80	1090	180	300	260	150	420	40	490	5220
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**400**	**1690**	**120**	**80**	**1090**	**180**	**300**	**260**	**150**	**420**	**40**	**490**	**5220**

ID	Intersection Name	Volume Type	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		Final Base	330	1160	50	460	2140	690	510	550	480	10	210	230	6820
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**330**	**1160**	**50**	**460**	**2140**	**690**	**510**	**550**	**480**	**10**	**210**	**230**	**6820**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		Final Base	10	1150	270	230	1620	400	590	400	30	160	260	220	5340
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**1150**	**270**	**230**	**1620**	**400**	**590**	**400**	**30**	**160**	**260**	**220**	**5340**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		Final Base	130	2000	700	410	2010	200	300	340	200	290	640	250	7470
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**130**	**2000**	**700**	**410**	**2010**	**200**	**300**	**340**	**200**	**290**	**640**	**250**	**7470**

ID	Intersection Name	Volume Type	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		Final Base	280	560	350	280	1340	520	380	1140	190	480	1050	170	6740
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**280**	**560**	**350**	**280**	**1340**	**520**	**380**	**1140**	**190**	**480**	**1050**	**170**	**6740**

ID	Intersection Name	Volume Type	Southbound		Northeastbound		Northwestbound		Total Volume
			Thru	Right	Left	Right	Left	Thru	
16		Final Base	1730	280	210	380	160	940	3700
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1730**	**280**	**210**	**380**	**160**	**940**	**3700**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		Final Base	300	1250	340	310	1020	280	120	490	260	470	1090	280	6210
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**300**	**1250**	**340**	**310**	**1020**	**280**	**120**	**490**	**260**	**470**	**1090**	**280**	**6210**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		Final Base	110	2500	430	110	2490	30	60	110	100	230	610	360	7140
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**2500**	**430**	**110**	**2490**	**30**	**60**	**110**	**100**	**230**	**610**	**360**	**7140**

ID	Intersection Name	Volume Type	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		Final Base	140	1930	180	40	1280	30	70	70	20	140	530	140	4570
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**1930**	**180**	**40**	**1280**	**30**	**70**	**70**	**20**	**140**	**530**	**140**	**4570**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		Final Base	30	380	50	90	350	30	50	110	50	130	460	30	1760
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**380**	**50**	**90**	**350**	**30**	**50**	**110**	**50**	**130**	**460**	**30**	**1760**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		Final Base	90	1690	30	20	1170	90	10	20	20	320	80	160	3700
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**90**	**1690**	**30**	**20**	**1170**	**90**	**10**	**20**	**20**	**320**	**80**	**160**	**3700**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		Final Base	40	2720	550	210	2720	50	140	140	90	220	530	450	7860
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**40**	**2720**	**550**	**210**	**2720**	**50**	**140**	**140**	**90**	**220**	**530**	**450**	**7860**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		Final Base	180	1210	130	110	1910	300	110	270	90	350	900	120	5680
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**180**	**1210**	**130**	**110**	**1910**	**300**	**110**	**270**	**90**	**350**	**900**	**120**	**5680**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		Final Base	60	370	40	130	310	20	60	400	50	100	990	90	2620
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**60**	**370**	**40**	**130**	**310**	**20**	**60**	**400**	**50**	**100**	**990**	**90**	**2620**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		Final Base	140	1620	440	210	980	30	340	420	210	30	980	110	5510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**1620**	**440**	**210**	**980**	**30**	**340**	**420**	**210**	**30**	**980**	**110**	**5510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		Final Base	260	1280	340	190	640	170	360	500	190	420	730	270	5350
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**1280**	**340**	**190**	**640**	**170**	**360**	**500**	**190**	**420**	**730**	**270**	**5350**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		Final Base	10	1850	540	240	1210	50	210	240	180	280	830	120	5760
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**1850**	**540**	**240**	**1210**	**50**	**210**	**240**	**180**	**280**	**830**	**120**	**5760**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		Final Base	140	230	160	210	220	100	40	430	170	170	1120	110	3100
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**230**	**160**	**210**	**220**	**100**	**40**	**430**	**170**	**170**	**1120**	**110**	**3100**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		Final Base	270	1810	360	80	1160	110	310	330	200	190	960	420	6200
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**270**	**1810**	**360**	**80**	**1160**	**110**	**310**	**330**	**200**	**190**	**960**	**420**	**6200**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		Final Base	150	1250	270	270	770	170	100	480	220	410	640	210	4940
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**150**	**1250**	**270**	**270**	**770**	**170**	**100**	**480**	**220**	**410**	**640**	**210**	**4940**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		Final Base	410	2370	680	380	1440	220	390	330	320	430	460	510	7940
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**410**	**2370**	**680**	**380**	**1440**	**220**	**390**	**330**	**320**	**430**	**460**	**510**	**7940**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		Final Base	70	60	50	120	70	160	50	570	140	550	1310	90	3240
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**70**	**60**	**50**	**120**	**70**	**160**	**50**	**570**	**140**	**550**	**1310**	**90**	**3240**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		Final Base	740	2280	630	260	1420	70	530	200	130	110	290	470	7130
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**740**	**2280**	**630**	**260**	**1420**	**70**	**530**	**200**	**130**	**110**	**290**	**470**	**7130**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		Final Base	250	1040	10	20	690	250	10	30	20	550	30	260	3160
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**250**	**1040**	**10**	**20**	**690**	**250**	**10**	**30**	**20**	**550**	**30**	**260**	**3160**

ID	Intersection Name	Volume Type	Northbound		Eastbound	Southwestbound		Total Volume
			Left	Right	Thru	Thru	Right	
35		Final Base	360	780	3160	1290	1090	6680
		Growth Factor	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0
		Other	0	0	0	0	0	0
		Future Total	**360**	**780**	**3160**	**1290**	**1090**	**6680**

ID	Intersection Name	Volume Type	Northbound		Southbound			Eastbound		Westbound			Total Volume
			Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		Final Base	170	460	1990	470	610	2500	170	350	870	620	8210
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**170**	**460**	**1990**	**470**	**610**	**2500**	**170**	**350**	**870**	**620**	**8210**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		Final Base	80	100	110	1240	430	30	20	480	610	220	960	340	4620
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**80**	**100**	**110**	**1240**	**430**	**30**	**20**	**480**	**610**	**220**	**960**	**340**	**4620**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		Final Base	100	2860	900	0	2400	110	500	70	810	130	10	280	8170
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**100**	**2860**	**900**	**0**	**2400**	**110**	**500**	**70**	**810**	**130**	**10**	**280**	**8170**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
			Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		Final Base	2310	50	290	1180	870	60	180	580	1520	740	20	7800
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**2310**	**50**	**290**	**1180**	**870**	**60**	**180**	**580**	**1520**	**740**	**20**	**7800**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		Final Base	720	1120	10	30	1640	220	20	30	30	350	60	1530	5760
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**720**	**1120**	**10**	**30**	**1640**	**220**	**20**	**30**	**30**	**350**	**60**	**1530**	**5760**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		Final Base	30	80	150	150	1540	160	50	870	50	240	70	180	3570
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**80**	**150**	**150**	**1540**	**160**	**50**	**870**	**50**	**240**	**70**	**180**	**3570**

ID	Intersection Name	Volume Type	Eastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
42		Final Base	1710	480	100	1070	930	340	4630
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1710**	**480**	**100**	**1070**	**930**	**340**	**4630**

ID	Intersection Name	Volume Type	Eastbound		Northeastbound		Southwestbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
51		Final Base	360	140	130	870	560	90	2150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**360**	**140**	**130**	**870**	**560**	**90**	**2150**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		Final Base	220	200	410	30	70	50	190	1520	160	420	1060	160	4490
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**220**	**200**	**410**	**30**	**70**	**50**	**190**	**1520**	**160**	**420**	**1060**	**160**	**4490**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		Final Base	340	870	30	60	770	420	30	10	20	680	20	330	3580
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**340**	**870**	**30**	**60**	**770**	**420**	**30**	**10**	**20**	**680**	**20**	**330**	**3580**

ID	Intersection Name	Volume Type	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
			2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		Final Base	30	660	110	160	10	740	300	220	40	290	390	20	2970
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**660**	**110**	**160**	**10**	**740**	**300**	**220**	**40**	**290**	**390**	**20**	**2970**

ID	Intersection Name	Volume Type	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		Final Base	20	10	10	100	20	110	30	1100	400	80	970	30	2880
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**20**	**10**	**10**	**100**	**20**	**110**	**30**	**1100**	**400**	**80**	**970**	**30**	**2880**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
102		Final Base	110	1620	1130	40	40	70	3010
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**110**	**1620**	**1130**	**40**	**40**	**70**	**3010**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	490	0	260	130	0	200	80	1200	170	520	1610	300
Future Volume (veh/h)	490	0	260	130	0	200	80	1200	170	520	1610	300
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	516	0	0	137	0	0	84	1263	0	547	1695	0
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	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	550	0		191	0		166	1771		616	2436	
Arrive On Green	0.31	0.00	0.00	0.06	0.00	0.00	0.05	0.35	0.00	0.18	0.48	0.00
Sat Flow, veh/h	1781	516		3456	137		3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	516	68.3		137	81.5		84	1263	0	547	1695	0
Grp Sat Flow(s),veh/h/ln	1781	E		1728	F		1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	45.8			6.3			3.9	34.9	0.0	25.1	42.2	0.0
Cycle Q Clear(g_c), s	45.8			6.3			3.9	34.9	0.0	25.1	42.2	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	550			191			166	1771		616	2436	
V/C Ratio(X)	0.94			0.72			0.51	0.71		0.89	0.70	
Avail Cap(c_a), veh/h	860			1669			210	1979		925	3035	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	54.7			75.5			75.5	46.1	0.0	65.2	33.3	0.0
Incr Delay (d2), s/veh	13.7			6.0			2.8	1.4	0.0	7.2	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
%ile BackOfQ(50%),veh/ln	22.7			3.0			1.8	15.1	0.0	11.7	17.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.3			81.5			78.3	47.4	0.0	72.4	34.0	0.0
LnGrp LOS	E			F			E	D		E	C	
Approach Vol, veh/h								1347	A		2242	A
Approach Delay, s/veh								49.3			43.4	
Approach LOS								D			D	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	37.5	66.4	17.5		16.3	87.5	58.7
Change Period (Y+Rc), s	8.5	10.0	8.5		8.5	10.0	8.5
Max Green Setting (Gmax), s	43.5	63.0	78.5		9.9	96.6	78.5
Max Q Clear Time (g_c+I1), s	27.1	36.9	8.3		5.9	44.2	47.8
Green Ext Time (p_c), s	1.9	15.5	0.6		0.1	33.3	2.3

Intersection Summary	
HCM 6th Ctrl Delay	49.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	720	0	350	50	0	60	460	1080	60	100	680	570
Future Volume (veh/h)	720	0	350	50	0	60	460	1080	60	100	680	570
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	800	0	0	56	0	0	511	1200	0	111	756	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	853	0		853	0		527	2231		138	1114	
Arrive On Green	0.25	0.00	0.00	0.25	0.00	0.00	0.59	0.87	0.00	0.08	0.22	0.00
Sat Flow, veh/h	3456	800		3456	56		1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	800	57.9		56	31.7		511	1200	0	111	756	0
Grp Sat Flow(s),veh/h/ln	1728	E		1728	C		1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	25.0			1.4			30.2	6.2	0.0	6.7	14.9	0.0
Cycle Q Clear(g_c), s	25.0			1.4			30.2	6.2	0.0	6.7	14.9	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	853			853			527	2231		138	1114	
V/C Ratio(X)	0.94			0.07			0.97	0.54		0.81	0.68	
Avail Cap(c_a), veh/h	864			864			559	2231		217	1114	
HCM Platoon Ratio	1.00			1.00			2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			0.77	0.77	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.6			31.7			22.0	4.3	0.0	49.9	39.5	0.0
Incr Delay (d2), s/veh	17.3			0.0			25.1	0.7	0.0	5.2	3.3	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5			0.6			11.7	1.5	0.0	3.2	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9			31.7			47.1	5.0	0.0	55.2	42.8	0.0
LnGrp LOS	E			C			D	A		E	D	
Approach Vol, veh/h								1711	A		867	A
Approach Delay, s/veh								17.6			44.4	
Approach LOS								B			D	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	41.1	33.3	35.6		17.0	57.4	35.6
Change Period (Y+Rc), s	8.5	9.3	8.5		8.5	9.3	8.5
Max Green Setting (Gmax), s	34.5	21.7	27.5		13.4	42.8	27.5
Max Q Clear Time (g_c+I1), s	32.2	16.9	3.4		8.7	8.2	27.0
Green Ext Time (p_c), s	0.4	2.6	0.1		0.0	15.2	0.2

Intersection Summary	
HCM 6th Ctrl Delay	34.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	230	1400	1010	470
Future Volume (veh/h)	0	0	230	1400	1010	470
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1870	1870	1870	1870
Adj Flow Rate, veh/h			250	1522	1098	511
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			353	3216	2575	1148
Arrive On Green			0.20	1.00	0.72	0.72
Sat Flow, veh/h			3456	3647	3647	1585
Grp Volume(v), veh/h			250	1522	1098	511
Grp Sat Flow(s),veh/h/ln			1728	1777	1777	1585
Q Serve(g_s), s			4.0	0.0	7.4	7.9
Cycle Q Clear(g_c), s			4.0	0.0	7.4	7.9
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			353	3216	2575	1148
V/C Ratio(X)			0.71	0.47	0.43	0.44
Avail Cap(c_a), veh/h			651	3216	2575	1148
HCM Platoon Ratio			2.00	2.00	1.00	1.00
Upstream Filter(I)			0.73	0.73	0.83	0.83
Uniform Delay (d), s/veh			23.0	0.0	3.3	3.4
Incr Delay (d2), s/veh			0.7	0.4	0.4	1.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			1.5	0.2	1.5	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			23.8	0.4	3.7	4.4
LnGrp LOS			C	A	A	A
Approach Vol, veh/h				1772	1609	
Approach Delay, s/veh				3.7	3.9	
Approach LOS				A	A	

Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		60.0			10.8	49.2
Change Period (Y+Rc), s		5.7			* 4.7	5.7
Max Green Setting (Gmax), s		54.3			* 11	38.3
Max Q Clear Time (g_c+I1), s		2.0			6.0	9.9
Green Ext Time (p_c), s		5.7			0.2	18.1

Intersection Summary	
HCM 6th Ctrl Delay	3.8
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	390	190	0	1380	1070	0
Future Volume (veh/h)	390	190	0	1380	1070	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	0
Adj Flow Rate, veh/h	406	198	0	1438	1115	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	563	258	0	2371	2371	0
Arrive On Green	0.16	0.16	0.00	0.67	1.00	0.00
Sat Flow, veh/h	3456	1585	0	3741	3741	0
Grp Volume(v), veh/h	406	198	0	1438	1115	0
Grp Sat Flow(s),veh/h/ln	1728	1585	0	1777	1777	0
Q Serve(g_s), s	6.7	7.2	0.0	13.6	0.0	0.0
Cycle Q Clear(g_c), s	6.7	7.2	0.0	13.6	0.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	563	258	0	2371	2371	0
V/C Ratio(X)	0.72	0.77	0.00	0.61	0.47	0.00
Avail Cap(c_a), veh/h	778	357	0	2371	2371	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.19	0.89	0.00
Uniform Delay (d), s/veh	23.8	24.0	0.0	5.6	0.0	0.0
Incr Delay (d2), s/veh	1.0	4.0	0.0	0.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.8	0.0	3.3	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.8	28.0	0.0	5.8	0.6	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	604			1438	1115	
Approach Delay, s/veh	25.9			5.8	0.6	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		45.7		14.3		45.7
Change Period (Y+Rc), s		5.7		4.5		5.7
Max Green Setting (Gmax), s		36.3		13.5		36.3
Max Q Clear Time (g_c+I1), s		15.6		9.2		2.0
Green Ext Time (p_c), s		14.9		0.6		15.5

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	360	0	780	0	3160	0	0	1290	1090
Future Volume (veh/h)	0	0	0	360	0	780	0	3160	0	0	1290	1090
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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	0	1870	0	1870	0	0	1870	1870
Adj Flow Rate, veh/h				379	0	821	0	3326	0	0	1358	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	0	0	2	2
Cap, veh/h				1090	0	880	0	3808	0	0	2214	
Arrive On Green				0.32	0.00	0.32	0.00	0.59	0.00	0.00	0.59	0.00
Sat Flow, veh/h				3456	0	2790	0	6958	0	0	3741	3170
Grp Volume(v), veh/h				379	0	821	0	3326	0	0	1358	0
Grp Sat Flow(s),veh/h/ln				1728	0	1395	0	1609	0	0	1870	1585
Q Serve(g_s), s				10.5	0.0	35.4	0.0	54.2	0.0	0.0	28.9	0.0
Cycle Q Clear(g_c), s				10.5	0.0	35.4	0.0	54.2	0.0	0.0	28.9	0.0
Prop In Lane				1.00		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1090	0	880	0	3808	0	0	2214	
V/C Ratio(X)				0.35	0.00	0.93	0.00	0.87	0.00	0.00	0.61	
Avail Cap(c_a), veh/h				1153	0	931	0	3817	0	0	2219	
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				32.6	0.0	41.2	0.0	21.4	0.0	0.0	16.2	0.0
Incr Delay (d2), s/veh				0.1	0.0	15.2	0.0	2.5	0.0	0.0	0.6	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				4.4	0.0	13.9	0.0	19.9	0.0	0.0	12.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.8	0.0	56.4	0.0	23.9	0.0	0.0	16.8	0.0
LnGrp LOS				C	A	E	A	C	A	A	B	
Approach Vol, veh/h					1200			3326			1358	A
Approach Delay, s/veh					48.9			23.9			16.8	
Approach LOS					D			C			B	

Timer - Assigned Phs	2		6		8							
Phs Duration (G+Y+Rc), s	79.3		79.3		44.7							
Change Period (Y+Rc), s	5.9		5.9		5.6							
Max Green Setting (Gmax), s	73.6		73.6		41.4							
Max Q Clear Time (g_c+I1), s	56.2		30.9		37.4							
Green Ext Time (p_c), s	17.2		18.9		1.7							

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1990	470	610	170	0	460	0	2500	170	350	870	620
Future Volume (veh/h)	1990	470	610	170	0	460	0	2500	170	350	870	620
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2073	490	635	177	0	479	0	2604	177	365	862	0
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	2	2	2	0	2	0	2	2	2	2	2
Cap, veh/h	1869	1322	590	0	0	0	0	2393	162	331	1927	
Arrive On Green	0.37	0.37	0.37	0.00	0.00	0.00	0.00	0.39	0.39	0.09	0.52	0.00
Sat Flow, veh/h	5023	3554	1585		0		0	6463	419	3563	3741	3170
Grp Volume(v), veh/h	2073	490	635		0.0		0	2023	758	365	862	0
Grp Sat Flow(s),veh/h/ln	1674	1777	1585				0	1609	1795	1781	1870	1585
Q Serve(g_s), s	43.2	11.7	43.2				0.0	44.8	44.8	10.8	16.9	0.0
Cycle Q Clear(g_c), s	43.2	11.7	43.2				0.0	44.8	44.8	10.8	16.9	0.0
Prop In Lane	1.00		1.00				0.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	1869	1322	590				0	1862	693	331	1927	
V/C Ratio(X)	1.11	0.37	1.08				0.00	1.09	1.09	1.10	0.45	
Avail Cap(c_a), veh/h	1869	1322	590				0	1862	693	331	1927	
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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.4	26.5	36.4				0.0	35.7	35.7	52.7	17.7	0.0
Incr Delay (d2), s/veh	57.5	0.1	59.4				0.0	48.6	62.9	79.5	0.2	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	27.2	4.9	26.0				0.0	25.5	31.2	8.5	7.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.9	26.6	95.8				0.0	84.3	98.5	132.1	17.9	0.0
LnGrp LOS	F	C	F				A	F	F	F	B	
Approach Vol, veh/h		3198						2781			1227	A
Approach Delay, s/veh		84.0						88.1			51.9	
Approach LOS		F						F			D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	15.0	51.1		50.0		66.1
Change Period (Y+Rc), s	* 4.2	6.3		6.8		6.3
Max Green Setting (Gmax), s	* 11	44.8		43.2		59.8
Max Q Clear Time (g_c+I1), s	12.8	46.8		45.2		18.9
Green Ext Time (p_c), s	0.0	0.0		0.0		7.4

Intersection Summary	
HCM 6th Ctrl Delay	80.1
HCM 6th LOS	F

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	960	340	20	480	610	80	100	110	1240	430	30
Future Volume (veh/h)	220	960	340	20	480	610	80	100	110	1240	430	30
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	229	1000	354	21	500	635	83	104	115	1089	733	31
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	276	1610	858	28	1382	1071	304	165	164	1021	1021	43
Arrive On Green	0.08	0.45	0.45	0.02	0.39	0.39	0.09	0.09	0.09	0.29	0.29	0.29
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	3456	1870	1585	3563	3563	151
Grp Volume(v), veh/h	229	1000	354	21	500	635	83	104	115	1089	385	379
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1728	1870	1585	1781	1870	1843
Q Serve(g_s), s	9.8	32.1	19.8	1.8	15.0	32.5	3.4	8.1	10.5	43.0	27.7	27.7
Cycle Q Clear(g_c), s	9.8	32.1	19.8	1.8	15.0	32.5	3.4	8.1	10.5	43.0	27.7	27.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	276	1610	858	28	1382	1071	304	165	164	1021	536	528
V/C Ratio(X)	0.83	0.62	0.41	0.76	0.36	0.59	0.27	0.63	0.70	1.07	0.72	0.72
Avail Cap(c_a), veh/h	378	1610	858	49	1382	1071	806	436	394	1021	536	528
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	0.36	0.36	0.36	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.0	31.2	20.3	73.6	32.6	13.2	63.9	66.1	65.0	53.5	48.0	48.1
Incr Delay (d2), s/veh	7.9	1.8	1.5	5.6	0.3	0.9	0.2	1.5	2.0	47.6	4.0	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	4.7	14.3	9.4	0.9	6.6	24.2	1.5	3.9	4.4	26.0	13.6	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.0	33.0	21.8	79.1	32.9	14.1	64.1	67.5	67.0	101.1	52.0	52.1
LnGrp LOS	E	C	C	E	C	B	E	E	E	F	D	D
Approach Vol, veh/h		1583			1156			302			1853	
Approach Delay, s/veh		36.7			23.4			66.4			80.9	
Approach LOS		D			C			E			F	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	16.5	64.3		19.2	6.8	74.0		50.0
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		7.0
Max Green Setting (Gmax), s	16.4	32.1		35.0	4.1	44.4		43.0
Max Q Clear Time (g_c+I1), s	11.8	34.5		12.5	3.8	34.1		45.0
Green Ext Time (p_c), s	0.2	0.0		0.7	0.0	4.3		0.0

Intersection Summary	
HCM 6th Ctrl Delay	52.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	10	280	500	70	810	100	2860	900	0	2400	110
Future Volume (veh/h)	130	10	280	500	70	810	100	2860	900	0	2400	110
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	10	289	367	0	1041	103	2948	928	0	2474	113
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	107	112	205	511	0	909	124	3030	856	1	3289	150
Arrive On Green	0.06	0.06	0.06	0.29	0.00	0.29	0.07	0.54	0.54	0.00	0.58	0.58
Sat Flow, veh/h	1781	1870	1585	1781	0	3170	1781	5611	1585	1781	7525	344
Grp Volume(v), veh/h	134	10	289	367	0	1041	103	2948	928	0	1992	595
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1585	1781	1870	1585	1781	1515	1809
Q Serve(g_s), s	9.0	0.8	9.0	27.8	0.0	43.0	8.6	76.4	81.0	0.0	36.7	36.7
Cycle Q Clear(g_c), s	9.0	0.8	9.0	27.8	0.0	43.0	8.6	76.4	81.0	0.0	36.7	36.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	107	112	205	511	0	909	124	3030	856	1	2649	791
V/C Ratio(X)	1.25	0.09	1.41	0.72	0.00	1.15	0.83	0.97	1.08	0.00	0.75	0.75
Avail Cap(c_a), veh/h	107	112	205	511	0	909	190	3030	856	59	2649	791
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.00	0.67	0.67
Uniform Delay (d), s/veh	70.5	66.6	65.3	48.1	0.0	53.5	68.9	33.4	34.5	0.0	25.4	25.4
Incr Delay (d2), s/veh	170.1	0.1	209.8	4.2	0.0	78.5	1.0	1.7	40.2	0.0	1.4	4.5
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	9.2	0.4	19.8	13.0	0.0	27.0	4.0	34.2	39.8	0.0	12.3	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	240.6	66.8	275.1	52.3	0.0	132.0	69.9	35.1	74.7	0.0	26.7	29.8
LnGrp LOS	F	E	F	D	A	F	E	D	F	A	C	C
Approach Vol, veh/h		433			1408			3979			2587	
Approach Delay, s/veh		259.6			111.2			45.3			27.4	
Approach LOS		F			F			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	87.0		14.0	15.4	71.6		49.0
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	71.0		9.0	16.0	60.0		43.0
Max Q Clear Time (g_c+I1), s	0.0	83.0		11.0	10.6	38.7		45.0
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	5.2		0.0

Intersection Summary	
HCM 6th Ctrl Delay	61.9
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

Appendix 5: Cumulative (2040) Plus Plan (with Recommended Improvements) Intersection Level of Service Worksheets

Lake Forest GPU (2040 Improvements AM)

Vistro File: H:\...\2040_Constrained_AM-mit.vistro
Report File: H:\...\2040ImprovedAM.pdf

Scenario: Base Scenario
10/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1		Signalized	ICU 1	NWB Left	0.478	-	A
2		Signalized	ICU 1	SWB Left	0.478	-	A
3		Signalized	ICU 1	NWB Thru	0.561	-	A
4		Signalized	ICU 1	NB Thru	0.548	-	A
5		Signalized	ICU 1	NEB Thru	0.661	-	B
6		Signalized	ICU 1	NEB Left	0.673	-	B
7		Signalized	ICU 1	NB Thru	0.394	-	A
8		Signalized	ICU 1	NB Thru	0.465	-	A
9		Signalized	ICU 1	SWB Thru	0.629	-	B
10		Signalized	ICU 1	NWB Thru	0.726	-	C
11		Signalized	ICU 1	SWB Thru	0.897	-	D
12		Signalized	ICU 1	NB Thru	0.642	-	B
13		Signalized	ICU 1	WB Thru	0.779	-	C
14		Signalized	ICU 1	NEB Thru	0.738	-	C
15		Signalized	ICU 1	SWB Thru	0.714	-	C
16		Signalized	ICU 1	NWB Thru	0.599	-	A
17		Signalized	ICU 1	SWB Thru	0.681	-	B
18		Signalized	ICU 1	NEB Thru	0.865	-	D
19		Signalized	ICU 1	SWB Thru	0.658	-	B
20		Signalized	ICU 1	SWB Thru	0.601	-	B
21		Signalized	ICU 1	SWB Thru	0.576	-	A
22		Signalized	ICU 1	NEB Thru	0.925	-	E
23		Signalized	ICU 1	WB Thru	0.685	-	B
24		Signalized	ICU 1	NWB Thru	0.556	-	A
25		Signalized	ICU 1	SWB Thru	0.691	-	B
26		Signalized	ICU 1	SWB Thru	0.781	-	C
27		Signalized	ICU 1	SWB Thru	0.586	-	A
28		Signalized	ICU 1	NWB Thru	0.494	-	A
29		Signalized	ICU 1	SWB Thru	0.742	-	C
30		Signalized	ICU 1	SWB Thru	0.656	-	B
31		Signalized	ICU 1	SWB Thru	0.687	-	B
32		Signalized	ICU 1	SEB Thru	0.450	-	A
33		Signalized	ICU 1	SWB Thru	0.816	-	D
34		Signalized	ICU 1	SWB Thru	0.663	-	B
35		Signalized	ICU 1	EB Thru	0.518	-	A

36		Signalized	ICU 1	WB Thru	0.645	-	B
37		Signalized	ICU 1	SWB Thru	0.606	-	B
38		Signalized	ICU 1	SWB Thru	0.781	-	C
39		Signalized	ICU 1	SWB Thru	0.472	-	A
40		Signalized	ICU 1	NB Thru	0.650	-	B
41		Signalized	ICU 1	SWB Thru	0.607	-	B
42		Signalized	ICU 1	SWB Thru	0.667	-	B
51		Signalized	ICU 1	SWB Right	0.443	-	A
56		Signalized	ICU 1	SWB Thru	0.811	-	D
57		Signalized	ICU 1	NEB Left	0.576	-	A
60		Signalized	ICU 1	NWB Thru	0.590	-	A
101		Signalized	ICU 1	SWB Thru	0.650	-	B
102		Signalized	ICU 1	SWB Thru	0.490	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.478

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	100.00	150.00	100.00	55.00	315.00	100.00	245.00	170.00	100.00	585.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	130	30	480	240	280	20	520	260	140	20	380	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.31	3.33	2.08	2.08	2.14	0.00	1.92	1.92	2.14	0.00	2.11	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	30	120	240	280	5	520	260	35	20	380	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	8	30	60	70	1	130	65	9	5	95	12
Total Analysis Volume [veh/h]	130	30	120	240	280	5	520	260	35	20	380	47
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Permis	Protect	Permis	Unsign	Protect	Permis	Unsign
Signal Group	7	4	0	3	8	8	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.00	0.14	0.08	0.00	0.15	0.05	0.00	0.01	0.11	0.00
Intersection LOS	A											
Intersection V/C	0.478											

Intersection Level Of Service Report
Intersection 2:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.478

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	190.00	100.00	180.00	285.00	100.00	285.00	230.00	100.00	100.00	230.00	100.00	220.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	130	210	300	260	390	190	480	330	140	360	370	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.31	1.90	2.00	1.92	2.05	2.11	2.08	2.12	2.14	1.94	1.89	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	210	75	260	390	47	480	330	140	360	370	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	53	19	65	98	12	120	83	35	90	93	9
Total Analysis Volume [veh/h]	130	210	75	260	390	47	480	330	140	360	370	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.06	0.04	0.15	0.11	0.03	0.14	0.09	0.09	0.11	0.07	0.02
Intersection LOS	A											
Intersection V/C	0.478											

Intersection Level Of Service Report
Intersection 3:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.561

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	195.00	100.00	295.00	110.00	100.00	425.00	300.00	100.00	100.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	120	220	250	200	390	20	600	860	240	30	760	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	1.82	2.00	2.00	2.05	0.00	2.00	1.98	2.08	3.33	1.97	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	220	62	200	390	5	600	860	240	30	760	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	55	16	50	98	1	150	215	60	8	190	13
Total Analysis Volume [veh/h]	120	220	62	200	390	5	600	860	240	30	760	52
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.06	0.04	0.12	0.11	0.00	0.18	0.22	0.22	0.01	0.15	0.03
Intersection LOS	A											
Intersection V/C	0.561											

Intersection Level Of Service Report
Intersection 4:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.548

Intersection Setup

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Approach	Northbound			Westbound			Northeastbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left2	Left	Thru	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	0	0	0	2	0	1
Pocket Length [ft]	200.00	100.00	100.00	215.00	100.00	345.00	100.00	100.00	100.00	515.00	100.00	185.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Base Volume Input [veh/h]	240	1250	700	710	120	870	90	50	120	220	840	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.08	2.00	2.00	1.97	1.67	1.95	2.22	2.00	1.67	1.82	2.02	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	240	1250	175	710	120	870	90	50	120	220	840	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	313	44	178	30	218	23	13	30	55	210	8
Total Analysis Volume [veh/h]	240	1250	175	710	120	870	90	50	120	220	840	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Protect	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	1	1	6	0	5	2	2	7	4	4
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	Lag	-	Lead	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.25	0.00	0.21	0.04	0.00	0.05	0.05	0.05	0.06	0.16	0.02
Intersection LOS	A											
Intersection V/C	0.548											

Intersection Level Of Service Report
Intersection 5:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	0	0	2	0	0	1
Pocket Length [ft]	535.00	100.00	300.00	620.00	100.00	70.00	100.00	100.00	555.00	100.00	100.00	730.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	210	1060	390	430	1470	60	200	0	430	340	0	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.90	1.98	2.05	2.09	1.97	1.67	2.00	0.00	2.09	2.06	0.00	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	210	1060	97	430	1470	15	200	0	107	340	0	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	265	24	108	368	4	50	0	27	85	0	7
Total Analysis Volume [veh/h]	210	1060	97	430	1470	15	200	0	107	340	0	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	212
Lost time [s]	11.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.21	0.00	0.13	0.29	0.00	0.06	0.00	0.00	0.20	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.661											

Intersection Level Of Service Report
Intersection 6:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.673

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	2	1	0	1
Pocket Length [ft]	170.00	100.00	100.00	370.00	100.00	100.00	100.00	100.00	435.00	550.00	100.00	550.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	380	540	140	50	1100	840	150	0	100	460	0	760
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.11	2.04	2.14	2.00	2.00	2.02	2.00	0.00	2.00	1.96	0.00	1.97
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	380	540	35	50	1100	210	150	0	25	460	0	190
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	135	9	13	275	53	38	0	6	115	0	48
Total Analysis Volume [veh/h]	380	540	35	50	1100	210	150	0	25	460	0	190
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.11	0.00	0.03	0.22	0.00	0.04	0.00	0.00	0.14	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.673											

Intersection Level Of Service Report
Intersection 7:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.394

Intersection Setup

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Approach	Northbound		Eastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Left	Right	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	1
Pocket Length [ft]	355.00	100.00	100.00	100.00	100.00	395.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Base Volume Input [veh/h]	150	1170	0	0	860	630
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.97	0.00	0.00	1.98	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	1170	0	0	860	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	293	0	0	215	39
Total Analysis Volume [veh/h]	150	1170	0	0	860	157
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	0	0	6	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.34	0.00	0.00	0.25	0.09
Intersection LOS	A					
Intersection V/C	0.394					

Intersection Level Of Service Report
Intersection 8:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.465

Intersection Setup

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Approach	Northbound		Southbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	655.00	365.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Base Volume Input [veh/h]	0	1010	930	0	400	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.98	2.04	0.00	2.00	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1010	930	0	400	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	253	233	0	100	11
Total Analysis Volume [veh/h]	0	1010	930	0	400	42
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	0	2	6	0	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.30	0.27	0.00	0.12	0.02
Intersection LOS	A					
Intersection V/C	0.465					

Intersection Level Of Service Report
Intersection 9:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	1
Pocket Length [ft]	100.00	230.00	390.00	100.00	185.00	145.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Base Volume Input [veh/h]	750	310	200	1050	820	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.94	2.00	2.00	1.95	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	750	77	200	1050	820	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	188	19	50	263	205	12
Total Analysis Volume [veh/h]	750	77	200	1050	820	47
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.05	0.12	0.31	0.24	0.01
Intersection LOS	B					
Intersection V/C	0.629					

Intersection Level Of Service Report
Intersection 10:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.726

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	340.00	100.00	200.00	250.00	100.00	110.00	245.00	100.00	215.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Base Volume Input [veh/h]	260	710	150	70	720	260	280	900	150	80	280	50
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	1.97	2.00	1.43	1.94	1.92	2.14	2.00	2.00	2.50	2.14	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	710	37	70	720	65	280	900	37	80	280	12
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	178	9	18	180	16	70	225	9	20	70	3
Total Analysis Volume [veh/h]	260	710	37	70	720	65	280	900	37	80	280	12
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.21	0.02	0.04	0.21	0.04	0.08	0.26	0.02	0.05	0.08	0.01
Intersection LOS	C											
Intersection V/C	0.726											

Intersection Level Of Service Report
Intersection 11:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.897

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	190.00	100.00	190.00	190.00	100.00	80.00	100.00	100.00	100.00	190.00	100.00	180.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Base Volume Input [veh/h]	460	890	390	170	1430	410	70	70	50	140	350	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	2.02	2.05	1.76	2.03	1.95	1.43	1.43	2.00	2.14	2.00	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	890	97	170	1430	102	70	70	50	140	350	340
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	223	24	43	358	26	18	18	13	35	88	85
Total Analysis Volume [veh/h]	460	890	97	170	1430	102	70	70	50	140	350	340
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.27	0.26	0.06	0.10	0.42	0.06	0.02	0.04	0.04	0.08	0.14	0.14
Intersection LOS	D											
Intersection V/C	0.897											

Intersection Level Of Service Report
Intersection 12:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.642

Intersection Setup

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	1	0	2
Pocket Length [ft]	400.00	100.00	100.00	200.00	100.00	100.00	395.00	100.00	260.00	150.00	100.00	170.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Base Volume Input [veh/h]	410	1990	30	150	1010	320	420	210	440	20	650	570
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.95	2.01	3.33	2.00	1.98	1.88	1.90	1.90	2.05	0.00	2.00	1.93
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	410	1990	30	150	1010	80	420	210	110	20	650	142
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	103	498	8	38	253	20	105	53	28	5	163	36
Total Analysis Volume [veh/h]	410	1990	30	150	1010	80	420	210	110	20	650	142
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.30	0.30	0.04	0.20	0.05	0.12	0.04	0.06	0.01	0.13	0.04
Intersection LOS	B											
Intersection V/C	0.642											

Intersection Level Of Service Report
Intersection 13:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Thru	Right	Right2	Left2	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	0
Pocket Length [ft]	285.00	100.00	180.00	285.00	100.00	220.00	345.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Base Volume Input [veh/h]	30	1370	150	240	1140	650	380	230	20	160	360	270
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	1.97	2.00	2.08	2.02	2.00	2.11	2.17	0.00	1.88	1.94	1.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	1370	20	240	1140	162	380	230	20	160	360	270
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	343	5	60	285	41	95	58	5	40	90	68
Total Analysis Volume [veh/h]	30	1370	20	240	1140	162	380	230	20	160	360	270
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Permis	Protect	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.40	0.01	0.14	0.34	0.10	0.11	0.15	0.15	0.09	0.11	0.19
Intersection LOS	C											
Intersection V/C	0.779											

Intersection Level Of Service Report
Intersection 14:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.738

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	2	2	0	1
Pocket Length [ft]	305.00	100.00	155.00	305.00	100.00	150.00	305.00	100.00	225.00	275.00	100.00	275.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Base Volume Input [veh/h]	150	2290	110	110	1700	190	550	800	390	230	230	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.01	1.82	1.82	2.00	2.11	2.00	2.00	2.05	2.17	2.17	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	2290	27	110	1700	47	550	800	97	230	230	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	573	7	28	425	12	138	200	24	58	58	8
Total Analysis Volume [veh/h]	150	2290	27	110	1700	47	550	800	97	230	230	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.45	0.02	0.03	0.33	0.03	0.16	0.12	0.06	0.07	0.05	0.02
Intersection LOS	C											
Intersection V/C	0.738											

Intersection Level Of Service Report
Intersection 15:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.714

Intersection Setup

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Approach	Northbound			Northeastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	0	2	0	1
Pocket Length [ft]	210.00	100.00	280.00	275.00	100.00	405.00	160.00	100.00	100.00	175.00	100.00	225.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Base Volume Input [veh/h]	560	930	390	170	890	190	290	1470	260	190	560	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	2.04	2.05	1.76	2.02	2.11	2.07	1.97	1.92	2.11	1.96	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	560	930	97	170	890	47	290	1470	260	190	560	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	140	233	24	43	223	12	73	368	65	48	140	16
Total Analysis Volume [veh/h]	560	930	97	170	890	47	290	1470	260	190	560	62
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	5	2	2	1	6	6	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.18	0.06	0.05	0.17	0.03	0.09	0.34	0.34	0.06	0.11	0.04
Intersection LOS	C											
Intersection V/C	0.714											

Intersection Level Of Service Report
Intersection 16:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.599

Intersection Setup

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Approach	Southbound		Northeastbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	0	0	1	0
Pocket Length [ft]	100.00	200.00	100.00	100.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Base Volume Input [veh/h]	700	340	330	290	370	1580
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.06	2.12	2.07	1.89	2.03
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	700	122	330	35	370	1580
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	175	31	83	9	93	395
Total Analysis Volume [veh/h]	700	122	330	35	370	1580
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Split	Split	Protected	Permissive
Signal Group	4	4	2	2	3	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lag	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.07	0.19	0.02	0.22	0.31
Intersection LOS	A					
Intersection V/C	0.599					

Intersection Level Of Service Report
Intersection 17:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	360.00	100.00	305.00	165.00	100.00	175.00	225.00	100.00	230.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Base Volume Input [veh/h]	120	790	160	300	1680	630	300	910	240	300	480	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	2.03	1.88	2.00	2.02	2.06	2.00	1.98	2.08	2.00	2.08	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	120	790	40	300	1680	157	300	910	60	300	480	120
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	198	10	75	420	39	75	228	15	75	120	30
Total Analysis Volume [veh/h]	120	790	40	300	1680	157	300	910	60	300	480	120
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3			6,7						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.15	0.00	0.09	0.33	0.00	0.09	0.18	0.04	0.09	0.12	0.12
Intersection LOS	B											
Intersection V/C	0.681											

Intersection Level Of Service Report
Intersection 18:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.865

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	180.00	100.00	205.00	205.00	100.00	225.00	285.00	100.00	100.00	205.00	100.00	110.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	320	2440	70	90	2270	160	270	450	120	50	60	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.88	2.01	1.43	2.22	1.98	1.88	1.85	2.00	1.67	2.00	1.67	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	320	2440	17	90	2270	40	270	450	120	50	60	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	610	4	23	568	10	68	113	30	13	15	4
Total Analysis Volume [veh/h]	320	2440	17	90	2270	40	270	450	120	50	60	15
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.19	0.48	0.01	0.05	0.45	0.02	0.16	0.17	0.17	0.01	0.02	0.01
Intersection LOS	D											
Intersection V/C	0.865											

Intersection Level Of Service Report
Intersection 19:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Approach	Eastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	185.00	180.00	100.00	200.00	155.00	100.00	100.00	135.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	160	1150	70	40	1890	150	160	400	50	20	130	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.88	2.00	1.43	2.50	2.01	2.00	1.88	2.00	2.00	0.00	2.31	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	1150	17	40	1890	37	160	400	50	20	130	35
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	288	4	10	473	9	40	100	13	5	33	9
Total Analysis Volume [veh/h]	160	1150	17	40	1890	37	160	400	50	20	130	35
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.23	0.01	0.02	0.37	0.02	0.09	0.13	0.13	0.01	0.05	0.05
Intersection LOS	B											
Intersection V/C	0.658											

Intersection Level Of Service Report
Intersection 20:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.601

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	110.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	90	380	210	170	600	220	320	210	40	40	170	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.22	2.11	1.90	1.76	2.00	1.82	1.88	1.90	2.50	2.50	1.76	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	380	210	170	600	220	320	210	40	40	170	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	95	53	43	150	55	80	53	10	10	43	15
Total Analysis Volume [veh/h]	90	380	210	170	600	220	320	210	40	40	170	60
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	157
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.17	0.17	0.10	0.24	0.24	0.19	0.07	0.07	0.02	0.07	0.07
Intersection LOS	B											
Intersection V/C	0.601											

Intersection Level Of Service Report
Intersection 21:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	250.00	100.00	250.00	210.00	100.00	1000.0	100.00	100.00	25.00	170.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	140	1040	30	20	1770	300	40	30	10	160	30	240
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.02	3.33	0.00	1.98	2.00	2.50	3.33	0.00	1.88	3.33	2.08
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	1040	7	20	1770	75	40	30	2	160	30	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	260	2	5	443	19	10	8	1	40	8	15
Total Analysis Volume [veh/h]	140	1040	7	20	1770	75	40	30	2	160	30	60
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.20	0.00	0.01	0.35	0.04	0.02	0.04	0.00	0.05	0.06	0.04
Intersection LOS	A											
Intersection V/C	0.576											

Intersection Level Of Service Report
Intersection 22:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.925

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	350.00	100.00	190.00	285.00	100.00	200.00	255.00	100.00	100.00	150.00	100.00	80.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	440	2680	80	60	2500	170	400	530	150	10	70	130
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.05	2.01	2.50	1.67	2.00	1.76	2.00	2.08	2.00	0.00	1.43	2.31
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	440	2680	20	60	2500	42	400	530	150	10	70	32
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	670	5	15	625	11	100	133	38	3	18	8
Total Analysis Volume [veh/h]	440	2680	20	60	2500	42	400	530	150	10	70	32
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.53	0.01	0.04	0.49	0.02	0.24	0.20	0.20	0.00	0.02	0.02
Intersection LOS	E											
Intersection V/C	0.925											

Intersection Level Of Service Report
Intersection 23:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	195.00	100.00	300.00	255.00	100.00	275.00	240.00	100.00	100.00	190.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	270	1550	410	100	980	200	300	640	350	100	180	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.85	2.00	1.95	2.00	2.04	2.00	2.00	2.03	2.00	2.00	2.22	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	1550	102	100	980	50	300	640	87	100	180	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	388	26	25	245	13	75	160	22	25	45	4
Total Analysis Volume [veh/h]	270	1550	102	100	980	50	300	640	87	100	180	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.30	0.06	0.06	0.19	0.03	0.18	0.21	0.21	0.06	0.05	0.01
Intersection LOS	B											
Intersection V/C	0.685											

Intersection Level Of Service Report
Intersection 24:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.556

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	115.00	175.00	100.00	95.00	95.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	110	410	150	130	500	440	200	660	130	110	400	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.95	2.00	2.31	2.00	2.05	2.00	1.97	2.31	1.82	2.00	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	410	37	130	500	110	200	660	130	110	400	170
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	103	9	33	125	28	50	165	33	28	100	43
Total Analysis Volume [veh/h]	110	410	37	130	500	110	200	660	130	110	400	170
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	105
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.12	0.02	0.08	0.15	0.06	0.12	0.23	0.23	0.06	0.17	0.17
Intersection LOS	A											
Intersection V/C	0.556											

Intersection Level Of Service Report
Intersection 25:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.691

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	1	0	0
Pocket Length [ft]	195.00	100.00	125.00	360.00	100.00	575.00	155.00	100.00	145.00	180.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	80	890	310	340	1590	200	410	680	280	100	440	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	2.02	1.94	2.06	2.01	2.00	1.95	2.06	2.14	2.00	2.05	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	890	77	340	1590	50	410	680	70	100	440	190
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	223	19	85	398	13	103	170	18	25	110	48
Total Analysis Volume [veh/h]	80	890	77	340	1590	50	410	680	70	100	440	190
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.17	0.00	0.10	0.31	0.03	0.12	0.20	0.04	0.06	0.19	0.19
Intersection LOS	B											
Intersection V/C	0.691											

Intersection Level Of Service Report
Intersection 26:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.781

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	285.00	100.00	100.00	295.00	100.00	110.00	180.00	100.00	175.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	240	760	200	380	1540	250	280	650	130	180	700	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.08	1.97	2.00	2.11	2.01	2.00	2.14	2.00	2.31	2.22	2.00	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	240	760	50	380	1540	62	280	650	32	180	700	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	60	190	13	95	385	16	70	163	8	45	175	21
Total Analysis Volume [veh/h]	240	760	50	380	1540	62	280	650	32	180	700	85
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.15	0.03	0.22	0.30	0.04	0.08	0.19	0.02	0.05	0.21	0.05
Intersection LOS	C											
Intersection V/C	0.781											

Intersection Level Of Service Report
Intersection 27:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.586

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	295.00	100.00	285.00	235.00	100.00	290.00	245.00	100.00	210.00	185.00	100.00	255.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	70	970	290	80	1640	180	350	590	210	70	210	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.43	1.96	2.07	2.50	2.01	2.22	2.00	2.03	1.90	1.43	1.90	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	970	72	80	1640	45	350	590	52	70	210	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	243	18	20	410	11	88	148	13	18	53	2
Total Analysis Volume [veh/h]	70	970	72	80	1640	45	350	590	52	70	210	7
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.04	0.02	0.32	0.03	0.10	0.17	0.03	0.02	0.06	0.00
Intersection LOS	A											
Intersection V/C	0.586											

Intersection Level Of Service Report
Intersection 28:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.494

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	185.00	100.00	190.00	175.00	100.00	200.00	180.00	100.00	95.00	300.00	100.00	125.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	110	320	90	190	340	350	80	630	150	90	430	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.88	2.22	2.11	2.06	2.00	2.50	2.06	2.00	2.22	2.09	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	320	22	190	340	87	80	630	37	90	430	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	80	6	48	85	22	20	158	9	23	108	4
Total Analysis Volume [veh/h]	110	320	22	190	340	87	80	630	37	90	430	17
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.09	0.01	0.11	0.10	0.05	0.05	0.19	0.02	0.05	0.13	0.01
Intersection LOS	A											
Intersection V/C	0.494											

Intersection Level Of Service Report
Intersection 29:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	245.00	100.00	100.00	150.00	100.00	345.00	215.00	100.00	120.00	170.00	100.00	295.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	160	910	220	190	1760	120	350	830	80	190	410	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.88	1.98	1.82	2.11	1.99	1.67	2.00	2.05	2.50	2.11	1.95	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	910	55	190	1760	30	350	830	20	190	410	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	228	14	48	440	8	88	208	5	48	103	16
Total Analysis Volume [veh/h]	160	910	55	190	1760	30	350	830	20	190	410	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.18	0.03	0.06	0.35	0.02	0.10	0.24	0.01	0.06	0.12	0.04
Intersection LOS	C											
Intersection V/C	0.742											

Intersection Level Of Service Report
Intersection 30:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	210.00	100.00	410.00	190.00	100.00	125.00	250.00	100.00	145.00	305.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	220	720	260	440	1230	450	230	450	200	180	580	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.94	1.92	2.05	2.03	2.00	2.17	2.00	2.00	2.22	2.07	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	720	65	440	1230	112	230	450	200	180	580	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	180	16	110	308	28	58	113	50	45	145	53
Total Analysis Volume [veh/h]	220	720	65	440	1230	112	230	450	200	180	580	210
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.14	0.04	0.13	0.24	0.07	0.07	0.13	0.12	0.05	0.23	0.23
Intersection LOS	B											
Intersection V/C	0.656											

Intersection Level Of Service Report
Intersection 31:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.687

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	1	2	0	1	2	0	2
Pocket Length [ft]	225.00	100.00	290.00	165.00	100.00	180.00	260.00	100.00	155.00	145.00	100.00	250.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	440	1250	390	380	1930	260	490	520	260	110	220	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.05	2.00	2.05	2.11	2.02	1.92	2.04	1.92	1.92	1.82	1.82	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	440	1250	97	380	1930	260	490	520	65	110	220	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	110	313	24	95	483	65	123	130	16	28	55	16
Total Analysis Volume [veh/h]	440	1250	97	380	1930	260	490	520	65	110	220	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.13	0.25	0.06	0.11	0.32	0.32	0.14	0.15	0.04	0.03	0.06	0.00
Intersection LOS	B											
Intersection V/C	0.687											

Intersection Level Of Service Report
Intersection 32:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.450

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	155.00	100.00	100.00	100.00	170.00	100.00	100.00	255.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	60	80	40	110	40	240	40	600	80	70	660	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	2.50	2.50	1.82	2.50	2.08	2.50	2.00	2.50	1.43	1.97	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	80	10	110	40	240	40	600	80	70	660	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	20	3	28	10	60	10	150	20	18	165	8
Total Analysis Volume [veh/h]	60	80	10	110	40	240	40	600	80	70	660	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	149
Lost time [s]	7.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	5	5	6	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.05	0.01	0.06	0.11	0.11	0.02	0.20	0.20	0.04	0.20	0.20
Intersection LOS	A											
Intersection V/C	0.450											

Intersection Level Of Service Report
Intersection 33:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	2	0	1	2	0	1
Pocket Length [ft]	250.00	100.00	235.00	200.00	100.00	100.00	195.00	100.00	200.00	245.00	100.00	155.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	490	1090	220	250	2030	60	810	190	170	80	260	600
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.04	2.02	1.82	2.00	2.02	1.67	1.98	2.11	1.76	2.50	1.92	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	490	1090	55	250	2030	60	810	190	42	80	260	150
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	123	273	14	63	508	15	203	48	11	20	65	38
Total Analysis Volume [veh/h]	490	1090	55	250	2030	60	810	190	42	80	260	150
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Unsign
Signal Group	5	2	2	1	6	6	3	8	8	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.16	0.03	0.07	0.31	0.31	0.24	0.06	0.02	0.02	0.08	0.00
Intersection LOS	D											
Intersection V/C	0.816											

Intersection Level Of Service Report
Intersection 34:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.663

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	160.00	100.00	160.00	100.00	100.00	50.00	250.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	260	710	10	20	1080	490	10	50	40	360	10	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	1.97	0.00	0.00	2.04	2.04	0.00	2.00	2.50	1.94	0.00	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	710	10	20	1080	122	10	50	40	360	10	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	178	3	5	270	31	3	13	10	90	3	16
Total Analysis Volume [veh/h]	260	710	10	20	1080	122	10	50	40	360	10	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.21	0.21	0.01	0.32	0.07	0.01	0.03	0.03	0.11	0.11	0.04
Intersection LOS	B											
Intersection V/C	0.663											

Intersection Level Of Service Report
Intersection 35:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.518

Intersection Setup

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Approach	Northbound			Eastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	640.00	100.00	640.00	190.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Base Volume Input [veh/h]	690	0	630	0	1820	0	0	1360	1390	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	0.00	2.06	0.00	1.98	0.00	0.00	1.99	2.01	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	690	0	157	0	1820	0	0	1360	347	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	173	0	39	0	455	0	0	340	87	0	0	0
Total Analysis Volume [veh/h]	690	0	157	0	1820	0	0	1360	347	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	8	0	8	0	2	0	0	6	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.00	0.05	0.00	0.27	0.00	0.00	0.27	0.20	0.00	0.00	0.00
Intersection LOS	A											
Intersection V/C	0.518											

Intersection Level Of Service Report
Intersection 36:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.645

Intersection Setup

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	125.00	100.00	125.00	100.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	465.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	190	0	300	1070	290	660	0	1090	80	360	1530	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.11	0.00	2.00	1.96	2.07	1.97	0.00	2.02	2.50	1.94	2.03	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	190	0	300	1070	290	165	0	1090	80	360	1530	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	0	75	268	73	41	0	273	20	90	383	29
Total Analysis Volume [veh/h]	190	0	300	1070	290	165	0	1090	80	360	1530	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Permis	Permis	Permis	Protect	Permis	Permis
Signal Group	8	0	8	4	4	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	-	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.09	0.21	0.09	0.10	0.00	0.17	0.17	0.11	0.30	0.07
Intersection LOS	B											
Intersection V/C	0.645											

Intersection Level Of Service Report
Intersection 37:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.606

Intersection Setup

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	2	1	0	1	2	0	1
Pocket Length [ft]	145.00	100.00	100.00	100.00	100.00	265.00	35.00	100.00	120.00	135.00	100.00	45.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	140	50	40	860	990	20	10	580	670	160	300	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.00	2.50	1.98	2.02	0.00	0.00	2.07	1.94	1.88	2.00	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	50	10	860	990	20	10	580	167	160	300	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	13	3	215	248	5	3	145	42	40	75	18
Total Analysis Volume [veh/h]	140	50	10	860	990	20	10	580	167	160	300	70
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Protect	Permis	Protect	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	8	1	6	6
Auxiliary Signal Groups			4,5									
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.03	0.00	0.25	0.30	0.30	0.01	0.17	0.10	0.05	0.09	0.04
Intersection LOS	B											
Intersection V/C	0.606											

Intersection Level Of Service Report
Intersection 38:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.781

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	1
Pocket Length [ft]	110.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	410.00	165.00	100.00	165.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Base Volume Input [veh/h]	100	1270	790	0	3840	90	400	70	450	50	10	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.97	2.03	0.00	2.01	2.22	2.00	1.43	2.00	2.00	0.00	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	1270	197	0	3840	90	400	70	450	50	10	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	318	49	0	960	23	100	18	113	13	3	53
Total Analysis Volume [veh/h]	100	1270	197	0	3840	90	400	70	450	50	10	210
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.25	0.12	0.00	0.46	0.46	0.12	0.18	0.18	0.03	0.01	0.06
Intersection LOS	C											
Intersection V/C	0.781											

Intersection Level Of Service Report
Intersection 39:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.472

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	2	0	1	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	305.00	100.00	135.00	215.00	100.00	100.00	215.00	100.00	90.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	0	1160	20	130	1260	1070	40	200	410	890	260	60
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.98	0.00	2.31	1.98	1.96	2.50	2.00	1.95	2.02	1.92	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1160	20	130	1260	267	40	200	102	890	260	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	290	5	33	315	67	10	50	26	223	65	4
Total Analysis Volume [veh/h]	0	1160	20	130	1260	267	40	200	102	890	260	15
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Protect	Permis	Permis	Permis	Permis	Overla	Split	Split	Split
Signal Group	0	2	2	1	6	6	8	8	1	4	4	4
Auxiliary Signal Groups									1,8			
Lead / Lag	-	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.17	0.17	0.04	0.25	0.16	0.02	0.14	0.00	0.17	0.08	0.01
Intersection LOS	A											
Intersection V/C	0.472											

Intersection Level Of Service Report
Intersection 40:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	0	0	1	1	0	0
Pocket Length [ft]	295.00	100.00	195.00	135.00	100.00	100.00	100.00	100.00	95.00	165.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Base Volume Input [veh/h]	1100	1690	10	40	1030	330	10	30	30	120	60	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.01	0.00	2.50	2.04	2.12	0.00	3.33	3.33	1.67	1.67	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1100	1690	2	40	1030	82	10	30	7	120	60	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	275	423	1	10	258	21	3	8	2	30	15	29
Total Analysis Volume [veh/h]	1100	1690	2	40	1030	82	10	30	7	120	60	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	182
Lost time [s]	9.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Protect	Permis	Permis	Permis	Split	Split	Split
Signal Group	5	2	2	1	6	4	8	8	1	4	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.32	0.33	0.00	0.01	0.20	0.05	0.01	0.01	0.00	0.04	0.05	0.07
Intersection LOS	B											
Intersection V/C	0.650											

Intersection Level Of Service Report
Intersection 41:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

Intersection Setup

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Approach	Southbound			Northeastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	200.00	100.00	205.00	225.00	100.00	230.00	260.00	100.00	155.00	245.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Base Volume Input [veh/h]	50	60	230	70	810	160	250	1660	70	260	70	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.67	2.17	1.43	1.98	1.88	2.00	1.99	1.43	1.92	1.43	2.50
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	50	60	57	70	810	40	250	1660	17	260	70	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	15	14	18	203	10	63	415	4	65	18	5
Total Analysis Volume [veh/h]	50	60	57	70	810	40	250	1660	17	260	70	20
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	111
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	7	4	4	5	2	2	1	6	6	3	8	8
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.02	0.03	0.04	0.16	0.02	0.07	0.33	0.01	0.15	0.02	0.01
Intersection LOS	B											
Intersection V/C	0.607											

Intersection Level Of Service Report
Intersection 42:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Approach	Eastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	2	0
Pocket Length [ft]	100.00	100.00	305.00	100.00	260.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Base Volume Input [veh/h]	790	610	350	2030	450	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	1.97	2.00	2.02	2.00	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	790	610	350	2030	450	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	198	153	88	508	113	7
Total Analysis Volume [veh/h]	790	610	350	2030	450	27
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	8	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.27	0.27	0.21	0.40	0.13	0.02
Intersection LOS	B					
Intersection V/C	0.667					

Intersection Level Of Service Report
Intersection 51:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.443

Intersection Setup

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Approach	Eastbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	255.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Base Volume Input [veh/h]	60	180	220	540	930	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	2.22	1.82	2.04	2.04	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	45	220	540	930	250
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	11	55	135	233	63
Total Analysis Volume [veh/h]	60	45	220	540	930	250
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	7	5	5	2	6	6
Auxiliary Signal Groups		5				
Lead / Lag	Lag	-	Lead	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.13	0.11	0.23	0.23
Intersection LOS	A					
Intersection V/C	0.443					

Intersection Level Of Service Report
Intersection 56:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.811

Intersection Setup

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Approach	Northbound			Southbound			Eastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	2	1	0	1	1	0	1
Pocket Length [ft]	170.00	100.00	170.00	100.00	100.00	165.00	290.00	100.00	225.00	295.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Base Volume Input [veh/h]	260	10	330	170	160	160	30	970	160	520	1320	100
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	0.00	2.12	1.76	1.88	1.88	3.33	1.96	1.88	1.92	1.97	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	10	82	170	160	40	30	970	40	520	1320	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	3	21	43	40	10	8	243	10	130	330	6
Total Analysis Volume [veh/h]	260	10	82	170	160	40	30	970	40	520	1320	25
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.01	0.05	0.10	0.09	0.02	0.02	0.29	0.02	0.31	0.39	0.01
Intersection LOS	D											
Intersection V/C	0.811											

Intersection Level Of Service Report
Intersection 57:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	140.00	100.00	175.00	105.00	100.00	200.00	100.00	100.00	35.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Base Volume Input [veh/h]	360	640	10	20	620	440	10	10	10	400	10	310
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	2.03	0.00	0.00	1.94	2.05	0.00	0.00	0.00	2.00	0.00	1.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	360	640	2	20	620	110	10	10	10	400	10	77
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	160	1	5	155	28	3	3	3	100	3	19
Total Analysis Volume [veh/h]	360	640	2	20	620	110	10	10	10	400	10	77
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.19	0.00	0.01	0.18	0.06	0.01	0.01	0.01	0.12	0.12	0.05
Intersection LOS	A											
Intersection V/C	0.576											

Intersection Level Of Service Report
Intersection 60:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.590

Intersection Setup

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Approach	Southbound			Eastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left2	Left	Right	Left2	Left	Thru	Left	Thru	Right	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	210.00	100.00	100.00	140.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Base Volume Input [veh/h]	40	250	70	90	170	270	10	10	10	620	560	270
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	2.00	1.43	2.22	1.76	1.85	0.00	0.00	0.00	1.94	1.96	1.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	250	17	90	170	270	10	10	10	620	560	270
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	63	4	23	43	68	3	3	3	155	140	68
Total Analysis Volume [veh/h]	40	250	17	90	170	270	10	10	10	620	560	270
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	129
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis
Signal Group	1	6	6	4	4	4	8	8	8	5	2	2
Auxiliary Signal Groups												
Lead / Lag	Lead	Lag	-	Lag	Lag	-	Lag	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.07	0.08	0.05	0.10	0.16	0.01	0.01	0.01	0.36	0.24	0.24
Intersection LOS	A											
Intersection V/C	0.590											

Intersection Level Of Service Report
Intersection 101:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.650

Intersection Setup

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Approach	Eastbound			Westbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	1
Pocket Length [ft]	65.00	100.00	100.00	60.00	100.00	100.00	150.00	100.00	190.00	155.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	20	20	40	440	20	100	10	760	220	140	900	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	2.50	2.05	0.00	2.00	0.00	1.97	1.82	2.14	2.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	20	40	440	20	100	10	760	55	140	900	2
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	5	10	110	5	25	3	190	14	35	225	1
Total Analysis Volume [veh/h]	20	20	40	440	20	100	10	760	55	140	900	2
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.04	0.04	0.26	0.07	0.07	0.01	0.22	0.03	0.08	0.26	0.00
Intersection LOS	B											
Intersection V/C	0.650											

Intersection Level Of Service Report
Intersection 102:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.490

Intersection Setup

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Base Volume Input [veh/h]	110	1040	1630	90	70	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	2.02	2.02	2.22	1.43	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1040	1630	90	70	52
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	260	408	23	18	13
Total Analysis Volume [veh/h]	110	1040	1630	90	70	52
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Overlap
Signal Group	5	2	6	6	7	5
Auxiliary Signal Groups						5
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.20	0.34	0.34	0.04	0.00
Intersection LOS	A					
Intersection V/C	0.490					

Lake Forest GPU (2040 Improvements AM)

Vistro File: H:\...\2040_Constrained_AM-mit.vistro
Report File: H:\...\2040ImprovedAM.pdf

Scenario: Base Scenario
10/11/2019

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		130	30	480	240	280	20	520	260	140	20	380	190	2690

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		130	210	300	260	390	190	480	330	140	360	370	150	3310

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		120	220	250	200	390	20	600	860	240	30	760	210	3900

ID	Intersection Name	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
		Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		240	1250	700	710	120	870	90	50	120	220	840	120	5330

ID	Intersection Name	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		210	1060	390	430	1470	60	200	430	340	110	4700

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		380	540	140	50	1100	840	150	100	460	760	4520

ID	Intersection Name	Northbound		Southwestbound		Total Volume
		Left	Thru	Thru	Right	
7		150	1170	860	630	2810

ID	Intersection Name	Northbound	Southbound	Southeastbound		Total Volume
		Thru	Thru	Left	Right	
8		1010	930	400	170	2510

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
9		750	310	200	1050	820	190	3320

ID	Intersection Name	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		260	710	150	70	720	260	280	900	150	80	280	50	3910

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		460	890	390	170	1430	410	70	70	50	140	350	340	4770

ID	Intersection Name	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		410	1990	30	150	1010	320	420	210	440	20	650	570	6220

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		30	1370	150	240	1140	650	380	230	20	160	360	270	5000

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		150	2290	110	110	1700	190	550	800	390	230	230	120	6870

ID	Intersection Name	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		560	930	390	170	890	190	290	1470	260	190	560	250	6150

ID	Intersection Name	Southbound		Northeastbound		Northwestbound		Total Volume
		Thru	Right	Left	Right	Left	Thru	
16		700	340	330	290	370	1580	3610

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		120	790	160	300	1680	630	300	910	240	300	480	120	6030

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		320	2440	70	90	2270	160	270	450	120	50	60	60	6360

ID	Intersection Name	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		160	1150	70	40	1890	150	160	400	50	20	130	140	4360

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		90	380	210	170	600	220	320	210	40	40	170	60	2510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		140	1040	30	20	1770	300	40	30	10	160	30	240	3810

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		440	2680	80	60	2500	170	400	530	150	10	70	130	7220

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		270	1550	410	100	980	200	300	640	350	100	180	70	5150

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		110	410	150	130	500	440	200	660	130	110	400	170	3410

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		80	890	310	340	1590	200	410	680	280	100	440	190	5510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		240	760	200	380	1540	250	280	650	130	180	700	340	5650

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		70	970	290	80	1640	180	350	590	210	70	210	30	4690

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		110	320	90	190	340	350	80	630	150	90	430	70	2850

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		160	910	220	190	1760	120	350	830	80	190	410	260	5480

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		220	720	260	440	1230	450	230	450	200	180	580	210	5170

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		440	1250	390	380	1930	260	490	520	260	110	220	260	6510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		60	80	40	110	40	240	40	600	80	70	660	30	2050

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		490	1090	220	250	2030	60	810	190	170	80	260	600	6250

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		260	710	10	20	1080	490	10	50	40	360	10	260	3300

ID	Intersection Name	Northbound		Eastbound	Southwestbound		Total Volume
		Left	Right	Thru	Thru	Right	
35		690	630	1820	1360	1390	5890

ID	Intersection Name	Northbound		Southbound			Eastbound		Westbound			Total Volume
		Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		190	300	1070	290	660	1090	80	360	1530	470	6040

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		140	50	40	860	990	20	10	580	670	160	300	70	3890

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		100	1270	790	0	3840	90	400	70	450	50	10	210	7280

ID	Intersection Name	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
		Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		1160	20	130	1260	1070	40	200	410	890	260	60	5500

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		1100	1690	10	40	1030	330	10	30	30	120	60	470	4920

ID	Intersection Name	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		50	60	230	70	810	160	250	1660	70	260	70	80	3770

ID	Intersection Name	Eastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
42		790	610	350	2030	450	110	4340

ID	Intersection Name	Eastbound		Northeastbound		Southwestbound		Total Volume
		Left	Right	Left	Thru	Thru	Right	
51		60	180	220	540	930	250	2180

ID	Intersection Name	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		260	10	330	170	160	160	30	970	160	520	1320	100	4190

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		360	640	10	20	620	440	10	10	10	400	10	310	2840

ID	Intersection Name	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
		2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		40	250	70	90	170	270	10	10	10	620	560	270	2370

ID	Intersection Name	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		20	20	40	440	20	100	10	760	220	140	900	10	2680

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
102		110	1040	1630	90	70	210	3150

Lake Forest GPU (2040 Improvements AM)

Vistro File: H:\...\2040_Constrained_AM-mit.vistro
Report File: H:\...\2040ImprovedAM.pdf

Scenario: Base Scenario
10/11/2019

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		Final Base	130	30	480	240	280	20	520	260	140	20	380	190	2690
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**130**	**30**	**480**	**240**	**280**	**20**	**520**	**260**	**140**	**20**	**380**	**190**	**2690**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		Final Base	130	210	300	260	390	190	480	330	140	360	370	150	3310
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**130**	**210**	**300**	**260**	**390**	**190**	**480**	**330**	**140**	**360**	**370**	**150**	**3310**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		Final Base	120	220	250	200	390	20	600	860	240	30	760	210	3900
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**120**	**220**	**250**	**200**	**390**	**20**	**600**	**860**	**240**	**30**	**760**	**210**	**3900**

ID	Intersection Name	Volume Type	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
			Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		Final Base	240	1250	700	710	120	870	90	50	120	220	840	120	5330
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**240**	**1250**	**700**	**710**	**120**	**870**	**90**	**50**	**120**	**220**	**840**	**120**	**5330**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		Final Base	210	1060	390	430	1470	60	200	430	340	110	4700
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**210**	**1060**	**390**	**430**	**1470**	**60**	**200**	**430**	**340**	**110**	**4700**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		Final Base	380	540	140	50	1100	840	150	100	460	760	4520
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**380**	**540**	**140**	**50**	**1100**	**840**	**150**	**100**	**460**	**760**	**4520**

ID	Intersection Name	Volume Type	Northbound		Southwestbound		Total Volume
			Left	Thru	Thru	Right	
7		Final Base	150	1170	860	630	2810
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**150**	**1170**	**860**	**630**	**2810**

ID	Intersection Name	Volume Type	Northbound	Southbound	Southeastbound		Total Volume
			Thru	Thru	Left	Right	
8		Final Base	1010	930	400	170	2510
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**1010**	**930**	**400**	**170**	**2510**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
9		Final Base	750	310	200	1050	820	190	3320
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**750**	**310**	**200**	**1050**	**820**	**190**	**3320**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		Final Base	260	710	150	70	720	260	280	900	150	80	280	50	3910
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**710**	**150**	**70**	**720**	**260**	**280**	**900**	**150**	**80**	**280**	**50**	**3910**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		Final Base	460	890	390	170	1430	410	70	70	50	140	350	340	4770
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**460**	**890**	**390**	**170**	**1430**	**410**	**70**	**70**	**50**	**140**	**350**	**340**	**4770**

ID	Intersection Name	Volume Type	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		Final Base	410	1990	30	150	1010	320	420	210	440	20	650	570	6220
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**410**	**1990**	**30**	**150**	**1010**	**320**	**420**	**210**	**440**	**20**	**650**	**570**	**6220**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		Final Base	30	1370	150	240	1140	650	380	230	20	160	360	270	5000
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**1370**	**150**	**240**	**1140**	**650**	**380**	**230**	**20**	**160**	**360**	**270**	**5000**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		Final Base	150	2290	110	110	1700	190	550	800	390	230	230	120	6870
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**150**	**2290**	**110**	**110**	**1700**	**190**	**550**	**800**	**390**	**230**	**230**	**120**	**6870**

ID	Intersection Name	Volume Type	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		Final Base	560	930	390	170	890	190	290	1470	260	190	560	250	6150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**560**	**930**	**390**	**170**	**890**	**190**	**290**	**1470**	**260**	**190**	**560**	**250**	**6150**

ID	Intersection Name	Volume Type	Southbound		Northeastbound		Northwestbound		Total Volume
			Thru	Right	Left	Right	Left	Thru	
16		Final Base	700	340	330	290	370	1580	3610
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**700**	**340**	**330**	**290**	**370**	**1580**	**3610**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		Final Base	120	790	160	300	1680	630	300	910	240	300	480	120	6030
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**120**	**790**	**160**	**300**	**1680**	**630**	**300**	**910**	**240**	**300**	**480**	**120**	**6030**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		Final Base	320	2440	70	90	2270	160	270	450	120	50	60	60	6360
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**320**	**2440**	**70**	**90**	**2270**	**160**	**270**	**450**	**120**	**50**	**60**	**60**	**6360**

ID	Intersection Name	Volume Type	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		Final Base	160	1150	70	40	1890	150	160	400	50	20	130	140	4360
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**160**	**1150**	**70**	**40**	**1890**	**150**	**160**	**400**	**50**	**20**	**130**	**140**	**4360**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		Final Base	90	380	210	170	600	220	320	210	40	40	170	60	2510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**90**	**380**	**210**	**170**	**600**	**220**	**320**	**210**	**40**	**40**	**170**	**60**	**2510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		Final Base	140	1040	30	20	1770	300	40	30	10	160	30	240	3810
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**1040**	**30**	**20**	**1770**	**300**	**40**	**30**	**10**	**160**	**30**	**240**	**3810**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		Final Base	440	2680	80	60	2500	170	400	530	150	10	70	130	7220
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**440**	**2680**	**80**	**60**	**2500**	**170**	**400**	**530**	**150**	**10**	**70**	**130**	**7220**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		Final Base	270	1550	410	100	980	200	300	640	350	100	180	70	5150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**270**	**1550**	**410**	**100**	**980**	**200**	**300**	**640**	**350**	**100**	**180**	**70**	**5150**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		Final Base	110	410	150	130	500	440	200	660	130	110	400	170	3410
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**410**	**150**	**130**	**500**	**440**	**200**	**660**	**130**	**110**	**400**	**170**	**3410**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		Final Base	80	890	310	340	1590	200	410	680	280	100	440	190	5510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**80**	**890**	**310**	**340**	**1590**	**200**	**410**	**680**	**280**	**100**	**440**	**190**	**5510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		Final Base	240	760	200	380	1540	250	280	650	130	180	700	340	5650
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**240**	**760**	**200**	**380**	**1540**	**250**	**280**	**650**	**130**	**180**	**700**	**340**	**5650**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		Final Base	70	970	290	80	1640	180	350	590	210	70	210	30	4690
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**70**	**970**	**290**	**80**	**1640**	**180**	**350**	**590**	**210**	**70**	**210**	**30**	**4690**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		Final Base	110	320	90	190	340	350	80	630	150	90	430	70	2850
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**320**	**90**	**190**	**340**	**350**	**80**	**630**	**150**	**90**	**430**	**70**	**2850**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		Final Base	160	910	220	190	1760	120	350	830	80	190	410	260	5480
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**160**	**910**	**220**	**190**	**1760**	**120**	**350**	**830**	**80**	**190**	**410**	**260**	**5480**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		Final Base	220	720	260	440	1230	450	230	450	200	180	580	210	5170
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**220**	**720**	**260**	**440**	**1230**	**450**	**230**	**450**	**200**	**180**	**580**	**210**	**5170**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		Final Base	440	1250	390	380	1930	260	490	520	260	110	220	260	6510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**440**	**1250**	**390**	**380**	**1930**	**260**	**490**	**520**	**260**	**110**	**220**	**260**	**6510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		Final Base	60	80	40	110	40	240	40	600	80	70	660	30	2050
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**60**	**80**	**40**	**110**	**40**	**240**	**40**	**600**	**80**	**70**	**660**	**30**	**2050**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		Final Base	490	1090	220	250	2030	60	810	190	170	80	260	600	6250
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**490**	**1090**	**220**	**250**	**2030**	**60**	**810**	**190**	**170**	**80**	**260**	**600**	**6250**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		Final Base	260	710	10	20	1080	490	10	50	40	360	10	260	3300
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**710**	**10**	**20**	**1080**	**490**	**10**	**50**	**40**	**360**	**10**	**260**	**3300**

ID	Intersection Name	Volume Type	Northbound		Eastbound	Southwestbound		Total Volume
			Left	Right	Thru	Thru	Right	
35		Final Base	690	630	1820	1360	1390	5890
		Growth Factor	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0
		Other	0	0	0	0	0	0
		Future Total	**690**	**630**	**1820**	**1360**	**1390**	**5890**

ID	Intersection Name	Volume Type	Northbound		Southbound			Eastbound		Westbound			Total Volume
			Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		Final Base	190	300	1070	290	660	1090	80	360	1530	470	6040
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**190**	**300**	**1070**	**290**	**660**	**1090**	**80**	**360**	**1530**	**470**	**6040**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		Final Base	140	50	40	860	990	20	10	580	670	160	300	70	3890
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**50**	**40**	**860**	**990**	**20**	**10**	**580**	**670**	**160**	**300**	**70**	**3890**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		Final Base	100	1270	790	0	3840	90	400	70	450	50	10	210	7280
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**100**	**1270**	**790**	**0**	**3840**	**90**	**400**	**70**	**450**	**50**	**10**	**210**	**7280**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
			Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		Final Base	1160	20	130	1260	1070	40	200	410	890	260	60	5500
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1160**	**20**	**130**	**1260**	**1070**	**40**	**200**	**410**	**890**	**260**	**60**	**5500**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		Final Base	1100	1690	10	40	1030	330	10	30	30	120	60	470	4920
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**1100**	**1690**	**10**	**40**	**1030**	**330**	**10**	**30**	**30**	**120**	**60**	**470**	**4920**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		Final Base	50	60	230	70	810	160	250	1660	70	260	70	80	3770
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**50**	**60**	**230**	**70**	**810**	**160**	**250**	**1660**	**70**	**260**	**70**	**80**	**3770**

ID	Intersection Name	Volume Type	Eastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
42		Final Base	790	610	350	2030	450	110	4340
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**790**	**610**	**350**	**2030**	**450**	**110**	**4340**

ID	Intersection Name	Volume Type	Eastbound		Northeastbound		Southwestbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
51		Final Base	60	180	220	540	930	250	2180
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**60**	**180**	**220**	**540**	**930**	**250**	**2180**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		Final Base	260	10	330	170	160	160	30	970	160	520	1320	100	4190
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**10**	**330**	**170**	**160**	**160**	**30**	**970**	**160**	**520**	**1320**	**100**	**4190**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		Final Base	360	640	10	20	620	440	10	10	10	400	10	310	2840
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**360**	**640**	**10**	**20**	**620**	**440**	**10**	**10**	**10**	**400**	**10**	**310**	**2840**

ID	Intersection Name	Volume Type	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
			2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		Final Base	40	250	70	90	170	270	10	10	10	620	560	270	2370
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**40**	**250**	**70**	**90**	**170**	**270**	**10**	**10**	**10**	**620**	**560**	**270**	**2370**

ID	Intersection Name	Volume Type	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		Final Base	20	20	40	440	20	100	10	760	220	140	900	10	2680
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**20**	**20**	**40**	**440**	**20**	**100**	**10**	**760**	**220**	**140**	**900**	**10**	**2680**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
102		Final Base	110	1040	1630	90	70	210	3150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**110**	**1040**	**1630**	**90**	**70**	**210**	**3150**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	340	0	110	200	0	430	430	1470	60	210	1060	390
Future Volume (veh/h)	340	0	110	200	0	430	430	1470	60	210	1060	390
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	395	0	0	233	0	0	500	1709	0	244	1233	0
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	493	0		315	0		606	2788		314	2358	
Arrive On Green	0.14	0.00	0.00	0.09	0.00	0.00	0.18	0.55	0.00	0.09	0.46	0.00
Sat Flow, veh/h	3456	395		3456	233		3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	395	54.5		233	58.4		500	1709	0	244	1233	0
Grp Sat Flow(s),veh/h/ln	1728	D		1728	E		1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	13.6			8.1			17.1	28.0	0.0	8.5	21.0	0.0
Cycle Q Clear(g_c), s	13.6			8.1			17.1	28.0	0.0	8.5	21.0	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	493			315			606	2788		314	2358	
V/C Ratio(X)	0.80			0.74			0.83	0.61		0.78	0.52	
Avail Cap(c_a), veh/h	1959			1959			1254	3790		691	2957	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	50.9			54.3			48.7	19.0	0.0	54.5	23.4	0.0
Incr Delay (d2), s/veh	3.7			4.1			3.5	0.4	0.0	4.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1			3.7			7.7	10.9	0.0	3.9	8.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5			58.4			52.3	19.4	0.0	58.6	23.7	0.0
LnGrp LOS	D			E			D	B		E	C	
Approach Vol, veh/h								2209	A		1477	A
Approach Delay, s/veh								26.8			29.5	
Approach LOS								C			C	

Timer - Assigned Phs	1	2	3	5	6	7
Phs Duration (G+Y+Rc), s	19.6	76.9	19.7	30.0	66.6	26.0
Change Period (Y+Rc), s	8.5	10.0	8.5	8.5	10.0	8.5
Max Green Setting (Gmax), s	24.5	91.0	69.5	44.5	71.0	69.5
Max Q Clear Time (g_c+I1), s	10.5	30.0	10.1	19.1	23.0	15.6
Green Ext Time (p_c), s	0.7	37.0	1.1	2.4	20.8	1.9

Intersection Summary	
HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	460	0	760	150	0	100	380	540	140	50	1100	840
Future Volume (veh/h)	460	0	760	150	0	100	380	540	140	50	1100	840
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	511	0	0	167	0	0	422	600	0	56	1222	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	574	0		574	0		503	2771		93	2294	
Arrive On Green	0.17	0.00	0.00	0.17	0.00	0.00	0.19	0.72	0.00	0.05	0.45	0.00
Sat Flow, veh/h	3456	511		3456	167		3456	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	511	58.6		167	40.4		422	600	0	56	1222	0
Grp Sat Flow(s),veh/h/ln	1728	E		1728	D		1728	1702	1585	1781	1702	1585
Q Serve(g_s), s	15.9			4.7			12.9	4.3	0.0	3.4	19.1	0.0
Cycle Q Clear(g_c), s	15.9			4.7			12.9	4.3	0.0	3.4	19.1	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	574			574			503	2771		93	2294	
V/C Ratio(X)	0.89			0.29			0.84	0.22		0.60	0.53	
Avail Cap(c_a), veh/h	625			625			1021	2771		146	2294	
HCM Platoon Ratio	1.00			1.00			1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			0.92	0.92	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	44.9			40.2			43.1	7.6	0.0	51.0	21.9	0.0
Incr Delay (d2), s/veh	13.8			0.2			2.7	0.2	0.0	2.3	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
%ile BackOfQ(50%),veh/ln	7.9			2.0			5.4	1.5	0.0	1.6	7.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6			40.4			45.8	7.8	0.0	53.3	22.8	0.0
LnGrp LOS	E			D			D	A		D	C	
Approach Vol, veh/h								1022	A		1278	A
Approach Delay, s/veh								23.5			24.2	
Approach LOS								C			C	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	24.5	58.7	26.8		14.2	69.0	26.8
Change Period (Y+Rc), s	8.5	9.3	8.5		8.5	9.3	8.5
Max Green Setting (Gmax), s	32.5	31.3	19.9		9.0	54.8	19.9
Max Q Clear Time (g_c+I1), s	14.9	21.1	6.7		5.4	6.3	17.9
Green Ext Time (p_c), s	1.1	7.0	0.3		0.0	6.9	0.4

Intersection Summary	
HCM 6th Ctrl Delay	30.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	150	1170	860	630
Future Volume (veh/h)	0	0	150	1170	860	630
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1870	1870	1870	1870
Adj Flow Rate, veh/h			172	1345	989	724
Peak Hour Factor			0.87	0.87	0.87	0.87
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			272	3216	2658	1186
Arrive On Green			0.16	1.00	0.75	0.75
Sat Flow, veh/h			3456	3647	3647	1585
Grp Volume(v), veh/h			172	1345	989	724
Grp Sat Flow(s),veh/h/ln			1728	1777	1777	1585
Q Serve(g_s), s			2.8	0.0	5.8	12.7
Cycle Q Clear(g_c), s			2.8	0.0	5.8	12.7
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			272	3216	2658	1186
V/C Ratio(X)			0.63	0.42	0.37	0.61
Avail Cap(c_a), veh/h			420	3216	2658	1186
HCM Platoon Ratio			2.00	2.00	1.00	1.00
Upstream Filter(I)			0.79	0.79	0.70	0.70
Uniform Delay (d), s/veh			24.5	0.0	2.6	3.5
Incr Delay (d2), s/veh			0.7	0.3	0.3	1.7
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			1.1	0.1	1.0	2.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			25.2	0.3	2.9	5.2
LnGrp LOS			C	A	A	A
Approach Vol, veh/h				1517	1713	
Approach Delay, s/veh				3.1	3.9	
Approach LOS				A	A	

Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		60.0			9.4	50.6
Change Period (Y+Rc), s		5.7			* 4.7	5.7
Max Green Setting (Gmax), s		54.3			* 7.3	42.3
Max Q Clear Time (g_c+I1), s		2.0			4.8	14.7
Green Ext Time (p_c), s		4.7			0.1	18.4

Intersection Summary	
HCM 6th Ctrl Delay	3.5
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	400	170	0	1010	930	0
Future Volume (veh/h)	400	170	0	1010	930	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	0
Adj Flow Rate, veh/h	471	200	0	1188	1094	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	611	280	0	2321	2321	0
Arrive On Green	0.18	0.18	0.00	0.65	1.00	0.00
Sat Flow, veh/h	3456	1585	0	3741	3741	0
Grp Volume(v), veh/h	471	200	0	1188	1094	0
Grp Sat Flow(s),veh/h/ln	1728	1585	0	1777	1777	0
Q Serve(g_s), s	7.8	7.1	0.0	10.5	0.0	0.0
Cycle Q Clear(g_c), s	7.8	7.1	0.0	10.5	0.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	611	280	0	2321	2321	0
V/C Ratio(X)	0.77	0.71	0.00	0.51	0.47	0.00
Avail Cap(c_a), veh/h	893	409	0	2321	2321	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.59	0.94	0.00
Uniform Delay (d), s/veh	23.5	23.3	0.0	5.4	0.0	0.0
Incr Delay (d2), s/veh	1.3	1.3	0.0	0.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.6	0.0	2.7	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.8	24.5	0.0	5.9	0.6	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	671			1188	1094	
Approach Delay, s/veh	24.7			5.9	0.6	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		44.9		15.1		44.9
Change Period (Y+Rc), s		5.7		4.5		5.7
Max Green Setting (Gmax), s		34.3		15.5		34.3
Max Q Clear Time (g_c+I1), s		12.5		9.8		2.0
Green Ext Time (p_c), s		12.9		0.8		14.8

Intersection Summary	
HCM 6th Ctrl Delay	8.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	690	0	630	0	1820	0	0	1360	1390
Future Volume (veh/h)	0	0	0	690	0	630	0	1820	0	0	1360	1390
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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	0	1870	0	1870	0	0	1870	1870
Adj Flow Rate, veh/h				704	0	643	0	1857	0	0	1388	0
Peak Hour Factor				0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %				2	0	2	0	2	0	0	2	2
Cap, veh/h				997	0	805	0	3707	0	0	2155	
Arrive On Green				0.29	0.00	0.29	0.00	0.58	0.00	0.00	0.58	0.00
Sat Flow, veh/h				3456	0	2790	0	6958	0	0	3741	3170
Grp Volume(v), veh/h				704	0	643	0	1857	0	0	1388	0
Grp Sat Flow(s),veh/h/ln				1728	0	1395	0	1609	0	0	1870	1585
Q Serve(g_s), s				15.5	0.0	18.1	0.0	14.6	0.0	0.0	21.2	0.0
Cycle Q Clear(g_c), s				15.5	0.0	18.1	0.0	14.6	0.0	0.0	21.2	0.0
Prop In Lane				1.00		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				997	0	805	0	3707	0	0	2155	
V/C Ratio(X)				0.71	0.00	0.80	0.00	0.50	0.00	0.00	0.64	
Avail Cap(c_a), veh/h				1685	0	1360	0	5577	0	0	3242	
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				27.0	0.0	27.9	0.0	10.7	0.0	0.0	12.1	0.0
Incr Delay (d2), s/veh				0.7	0.0	1.4	0.0	0.1	0.0	0.0	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
%ile BackOfQ(50%),veh/ln				6.2	0.0	6.0	0.0	4.7	0.0	0.0	8.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				27.7	0.0	29.3	0.0	10.9	0.0	0.0	12.6	0.0
LnGrp LOS				C	A	C	A	B	A	A	B	
Approach Vol, veh/h					1347			1857			1388	A
Approach Delay, s/veh					28.5			10.9			12.6	
Approach LOS					C			B			B	

Timer - Assigned Phs	2				6		8					
Phs Duration (G+Y+Rc), s	54.8				54.8		30.1					
Change Period (Y+Rc), s	5.9				5.9		5.6					
Max Green Setting (Gmax), s	73.6				73.6		41.4					
Max Q Clear Time (g_c+I1), s	16.6				23.2		20.1					
Green Ext Time (p_c), s	32.3				20.8		4.4					

Intersection Summary	
HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1070	290	660	190	0	300	0	1090	80	360	1530	470
Future Volume (veh/h)	1070	290	660	190	0	300	0	1090	80	360	1530	470
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1103	299	680	196	0	309	0	1124	82	371	1577	0
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	2	2	2	0	2	0	2	2	2	2	2
Cap, veh/h	2291	1621	723	0	0	0	0	1513	110	441	2310	
Arrive On Green	0.46	0.46	0.46	0.00	0.00	0.00	0.00	0.25	0.25	0.12	0.41	0.00
Sat Flow, veh/h	5023	3554	1585		0		0	6429	448	3563	5611	1585
Grp Volume(v), veh/h	1103	299	680		0.0		0	878	328	371	1577	0
Grp Sat Flow(s),veh/h/ln	1674	1777	1585				0	1609	1790	1781	1870	1585
Q Serve(g_s), s	15.2	4.9	40.5				0.0	16.6	16.8	10.1	22.8	0.0
Cycle Q Clear(g_c), s	15.2	4.9	40.5				0.0	16.6	16.8	10.1	22.8	0.0
Prop In Lane	1.00		1.00				0.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	2291	1621	723				0	1184	439	441	2310	
V/C Ratio(X)	0.48	0.18	0.94				0.00	0.74	0.75	0.84	0.68	
Avail Cap(c_a), veh/h	2647	1872	835				0	1403	520	547	2730	
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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	18.8	16.0	25.7				0.0	34.5	34.5	42.4	23.9	0.0
Incr Delay (d2), s/veh	0.1	0.0	16.2				0.0	1.8	4.9	7.9	0.6	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	5.7	2.0	17.6				0.0	6.6	7.8	4.9	9.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	16.0	41.8				0.0	36.3	39.4	50.3	24.4	0.0
LnGrp LOS	B	B	D				A	D	D	D	C	
Approach Vol, veh/h		2082						1206			1948	A
Approach Delay, s/veh		25.9						37.1			29.4	
Approach LOS		C						D			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	16.5	30.6		52.0		47.1
Change Period (Y+Rc), s	* 4.2	6.3		6.8		6.3
Max Green Setting (Gmax), s	* 15	28.8		52.2		48.2
Max Q Clear Time (g_c+I1), s	12.1	18.8		42.5		24.8
Green Ext Time (p_c), s	0.2	5.5		2.7		13.0

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	300	70	10	580	670	140	50	40	860	990	20
Future Volume (veh/h)	160	300	70	10	580	670	140	50	40	860	990	20
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	168	316	74	11	611	705	147	53	42	905	1042	21
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	1581	800	18	1424	1138	206	112	110	1131	1160	23
Arrive On Green	0.05	0.44	0.44	0.01	0.40	0.40	0.06	0.06	0.06	0.32	0.32	0.32
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	3456	1870	1585	3563	3654	74
Grp Volume(v), veh/h	168	316	74	11	611	705	147	53	42	905	533	530
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1728	1870	1585	1781	1870	1857
Q Serve(g_s), s	6.8	7.6	3.4	0.9	17.4	31.6	5.8	3.8	3.5	32.5	38.1	38.1
Cycle Q Clear(g_c), s	6.8	7.6	3.4	0.9	17.4	31.6	5.8	3.8	3.5	32.5	38.1	38.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	188	1581	800	18	1424	1138	206	112	110	1131	594	590
V/C Ratio(X)	0.90	0.20	0.09	0.62	0.43	0.62	0.71	0.47	0.38	0.80	0.90	0.90
Avail Cap(c_a), veh/h	188	1581	800	52	1424	1138	864	468	412	1221	641	637
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	0.17	0.17	0.17	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	23.7	18.0	69.0	30.4	10.0	64.6	63.7	62.2	43.7	45.6	45.6
Incr Delay (d2), s/veh	37.1	0.3	0.2	2.2	0.2	0.4	1.7	1.2	0.8	3.2	14.1	14.2
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	4.0	3.3	1.5	0.4	7.6	25.5	2.6	1.9	1.5	14.9	20.0	19.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	102.9	24.0	18.3	71.3	30.5	10.4	66.4	64.9	63.0	46.9	59.7	59.8
LnGrp LOS	F	C	B	E	C	B	E	E	E	D	E	E
Approach Vol, veh/h		558			1327			242			1968	
Approach Delay, s/veh		47.0			20.2			65.5			53.8	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.1	62.1		14.4	5.9	68.3		51.5
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		7.0
Max Green Setting (Gmax), s	7.6	25.9		35.0	4.1	29.4		48.0
Max Q Clear Time (g_c+I1), s	8.8	33.6		7.8	2.9	9.6		40.1
Green Ext Time (p_c), s	0.0	0.0		0.5	0.0	1.4		4.3

Intersection Summary	
HCM 6th Ctrl Delay	42.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	10	210	400	70	450	100	1270	790	0	3840	90
Future Volume (veh/h)	50	10	210	400	70	450	100	1270	790	0	3840	90
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	11	221	305	0	647	105	1181	936	0	4042	95
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	120	170	386	0	686	76	2236	1895	1	4007	94
Arrive On Green	0.06	0.06	0.06	0.22	0.00	0.22	0.04	0.60	0.60	0.00	1.00	1.00
Sat Flow, veh/h	1781	1870	1585	1781	0	3170	1781	3741	3170	1781	7718	180
Grp Volume(v), veh/h	53	11	221	305	0	647	105	1181	936	0	3168	969
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1585	1781	1870	1585	1781	1515	1838
Q Serve(g_s), s	4.0	0.8	9.0	22.7	0.0	28.1	6.0	26.0	23.6	0.0	0.0	72.7
Cycle Q Clear(g_c), s	4.0	0.8	9.0	22.7	0.0	28.1	6.0	26.0	23.6	0.0	0.0	72.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	115	120	170	386	0	686	76	2236	1895	1	3146	954
V/C Ratio(X)	0.46	0.09	1.30	0.79	0.00	0.94	1.38	0.53	0.49	0.00	1.01	1.02
Avail Cap(c_a), veh/h	115	120	170	509	0	906	76	2236	1895	64	3146	954
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.69	0.69	0.69	0.00	0.32	0.32
Uniform Delay (d), s/veh	63.2	61.7	62.5	51.9	0.0	54.0	67.0	16.5	16.1	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.1	171.7	4.4	0.0	13.5	215.6	0.6	0.6	0.0	10.8	20.4
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	1.9	0.4	14.2	10.6	0.0	12.5	7.3	11.2	8.6	0.0	2.4	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	61.8	234.2	56.3	0.0	67.4	282.6	17.2	16.7	0.0	10.8	20.4
LnGrp LOS	E	E	F	E	A	E	F	B	B	A	F	F
Approach Vol, veh/h		285			952			2222			4137	
Approach Delay, s/veh		196.0			63.9			29.5			13.0	
Approach LOS		F			E			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	89.7		14.0	11.0	78.7		36.3
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	64.0		9.0	6.0	63.0		40.0
Max Q Clear Time (g_c+I1), s	0.0	28.0		11.0	8.0	74.7		30.1
Green Ext Time (p_c), s	0.0	2.1		0.0	0.0	0.0		0.2

Intersection Summary	
HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Lake Forest GPU (2040 Improvements PM)

Vistro File: H:\...\2040_Constrained_PM-mit.vistro
Report File: H:\...\2040ImprovedAM.pdf

Scenario: Base Scenario
10/11/2019

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1		Signalized	ICU 1	NWB Left	0.431	-	A
2		Signalized	ICU 1	SWB Left	0.617	-	B
3		Signalized	ICU 1	NWB Right	0.605	-	B
4		Signalized	ICU 1	SEB Thru	0.615	-	B
5		Signalized	ICU 1	SB Thru	0.767	-	C
6		Signalized	ICU 1	NEB Left	0.685	-	B
7		Signalized	ICU 1	NB Thru	0.462	-	A
8		Signalized	ICU 1	NB Thru	0.571	-	A
9		Signalized	ICU 1	NEB Thru	0.763	-	C
10		Signalized	ICU 1	SEB Thru	0.888	-	D
11		Signalized	ICU 1	NEB Thru	0.854	-	D
12		Signalized	ICU 1	SB Thru	0.762	-	C
13		Signalized	ICU 1	NEB Thru	0.677	-	B
14		Signalized	ICU 1	SWB Thru	0.780	-	C
15		Signalized	ICU 1	NEB Thru	0.713	-	C
16		Signalized	ICU 1	SB Thru	0.607	-	B
17		Signalized	ICU 1	SEB Thru	0.694	-	B
18		Signalized	ICU 1	NEB Thru	0.823	-	D
19		Signalized	ICU 1	EB Thru	0.690	-	B
20		Signalized	ICU 1	SEB Right	0.404	-	A
21		Signalized	ICU 1	NEB Thru	0.532	-	A
22		Signalized	ICU 1	SWB Thru	0.887	-	D
23		Signalized	ICU 1	NEB Thru	0.860	-	D
24		Signalized	ICU 1	SEB Thru	0.588	-	A
25		Signalized	ICU 1	SEB Thru	0.853	-	D
26		Signalized	ICU 1	NEB Thru	0.737	-	C
27		Signalized	ICU 1	NEB Thru	0.789	-	C
28		Signalized	ICU 1	SEB Thru	0.594	-	A
29		Signalized	ICU 1	NEB Thru	0.805	-	D
30		Signalized	ICU 1	SEB Thru	0.658	-	B
31		Signalized	ICU 1	NEB Thru	0.880	-	D
32		Signalized	ICU 1	SEB Right	0.730	-	C
33		Signalized	ICU 1	NEB Thru	0.731	-	C
34		Signalized	ICU 1	NB Thru	0.592	-	A
35		Signalized	ICU 1	EB Thru	0.618	-	B

36		Signalized	ICU 1	EB Thru	0.901	-	E
37		Signalized	ICU 1	SEB Thru	0.621	-	B
38		Signalized	ICU 1	NEB Thru	0.821	-	D
39		Signalized	ICU 1	NEB Thru	0.780	-	C
40		Signalized	ICU 1	SWB Thru	0.813	-	D
41		Signalized	ICU 1	NEB Thru	0.535	-	A
42		Signalized	ICU 1	EB Right	0.816	-	D
51		Signalized	ICU 1	EB Left	0.463	-	A
56		Signalized	ICU 1	EB Thru	0.883	-	D
57		Signalized	ICU 1	NEB Thru	0.700	-	B
60		Signalized	ICU 1	EB Thru	0.885	-	D
101		Signalized	ICU 1	NEB Thru	0.509	-	A
102		Signalized	ICU 1	NEB Thru	0.388	-	A

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.431

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	175.00	100.00	100.00	150.00	100.00	55.00	315.00	100.00	245.00	170.00	100.00	585.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	200	270	630	150	110	30	470	190	240	10	240	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.85	2.06	2.00	1.82	3.33	1.91	2.11	2.08	0.00	2.08	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	200	270	157	150	110	7	470	190	60	10	240	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	50	68	39	38	28	2	118	48	15	3	60	11
Total Analysis Volume [veh/h]	200	270	157	150	110	7	470	190	60	10	240	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Permis	Protect	Permis	Unsign	Protect	Permis	Unsign
Signal Group	7	4	0	3	8	8	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.08	0.00	0.09	0.03	0.00	0.14	0.04	0.00	0.00	0.07	0.00
Intersection LOS	A											
Intersection V/C	0.431											

Intersection Level Of Service Report
Intersection 2:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.617

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	190.00	100.00	180.00	285.00	100.00	285.00	230.00	100.00	100.00	230.00	100.00	220.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	230	350	350	360	250	110	410	760	100	230	650	150
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.17	2.00	2.00	1.94	2.00	1.82	1.95	1.97	2.00	2.17	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	350	87	360	250	27	410	760	100	230	650	37
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	88	22	90	63	7	103	190	25	58	163	9
Total Analysis Volume [veh/h]	230	350	87	360	250	27	410	760	100	230	650	37
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.14	0.10	0.05	0.21	0.07	0.02	0.12	0.17	0.17	0.07	0.13	0.02
Intersection LOS	B											
Intersection V/C	0.617											

Intersection Level Of Service Report
Intersection 3:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.605

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	2	0	1
Pocket Length [ft]	195.00	100.00	295.00	110.00	100.00	425.00	300.00	100.00	100.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Portola Pkwy.			Portola Pkwy.		
Base Volume Input [veh/h]	270	310	460	130	290	30	320	1030	180	10	1110	220
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.85	1.94	1.96	2.31	2.07	3.33	1.88	2.04	2.22	0.00	1.98	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	310	115	130	290	7	320	1030	180	10	1110	55
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	78	29	33	73	2	80	258	45	3	278	14
Total Analysis Volume [veh/h]	270	310	115	130	290	7	320	1030	180	10	1110	55
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	122
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.16	0.09	0.07	0.08	0.09	0.00	0.09	0.24	0.24	0.00	0.22	0.03
Intersection LOS	B											
Intersection V/C	0.605											

Intersection Level Of Service Report
Intersection 4:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.615

Intersection Setup

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Approach	Northbound			Westbound			Northeastbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left2	Left	Thru	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	0	0	0	2	0	1
Pocket Length [ft]	200.00	100.00	100.00	215.00	100.00	345.00	100.00	100.00	100.00	515.00	100.00	185.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Glenn Ranch Rd.			Glenn Ranch Rd.			Portola Pkwy.		
Base Volume Input [veh/h]	110	920	880	650	80	400	130	80	180	900	1450	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.96	2.05	2.00	2.50	2.00	2.31	2.50	2.22	2.00	2.00	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	920	220	650	80	400	130	80	180	900	1450	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	230	55	163	20	100	33	20	45	225	363	8
Total Analysis Volume [veh/h]	110	920	220	650	80	400	130	80	180	900	1450	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	120
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Protect	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	1	1	6	0	5	2	2	7	4	4
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	Lag	-	Lead	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.18	0.00	0.19	0.02	0.00	0.08	0.08	0.08	0.26	0.28	0.02
Intersection LOS	B											
Intersection V/C	0.615											

Intersection Level Of Service Report
Intersection 5:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.767

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	0	0	2	0	0	1
Pocket Length [ft]	535.00	100.00	300.00	620.00	100.00	70.00	100.00	100.00	555.00	100.00	100.00	730.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	520	1610	300	80	1200	170	130	0	200	490	0	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	1.99	2.00	2.50	2.00	1.76	2.31	0.00	2.00	2.04	0.00	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	520	1610	75	80	1200	42	130	0	50	490	0	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	130	403	19	20	300	11	33	0	13	123	0	16
Total Analysis Volume [veh/h]	520	1610	75	80	1200	42	130	0	50	490	0	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	212
Lost time [s]	11.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.32	0.00	0.02	0.24	0.00	0.04	0.00	0.00	0.29	0.00	0.00
Intersection LOS	C											
Intersection V/C	0.767											

Intersection Level Of Service Report
Intersection 6:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.685

Intersection Setup

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	2	1	0	1
Pocket Length [ft]	170.00	100.00	100.00	370.00	100.00	100.00	100.00	100.00	435.00	550.00	100.00	550.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

Volumes

Name	Alton Pkwy.			Alton Pkwy.			SR-241 Ramps			SR-241 Ramps		
Base Volume Input [veh/h]	460	1080	60	100	680	570	50	0	60	720	0	350
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.96	2.04	1.67	2.00	2.06	1.93	2.00	0.00	1.67	1.94	0.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	460	1080	15	100	680	142	50	0	15	720	0	87
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	115	270	4	25	170	36	13	0	4	180	0	22
Total Analysis Volume [veh/h]	460	1080	15	100	680	142	50	0	15	720	0	87
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Unsign	Protect	Permis	Unsign	Permis	Permis	Unsign	Permis	Permis	Unsign
Signal Group	1	6	0	5	2	0	8	0	0	4	0	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.27	0.21	0.00	0.06	0.13	0.00	0.01	0.00	0.00	0.21	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.685											

Intersection Level Of Service Report
Intersection 7:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.462

Intersection Setup

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Approach	Northbound		Eastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Thru	Left	Right	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	1
Pocket Length [ft]	355.00	100.00	100.00	100.00	100.00	395.00
Speed [mph]	30.00		0.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	Lake Forest Dr.		SR-241 NB Ramp		Lake Forest Dr.	
Base Volume Input [veh/h]	230	1400	0	0	1010	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.17	2.00	0.00	0.00	1.98	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	230	1400	0	0	1010	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	58	350	0	0	253	29
Total Analysis Volume [veh/h]	230	1400	0	0	1010	117
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Permissive
Signal Group	5	2	0	0	6	6
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.41	0.00	0.00	0.30	0.07
Intersection LOS	A					
Intersection V/C	0.462					

Intersection Level Of Service Report
Intersection 8:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.571

Intersection Setup

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Approach	Northbound		Southbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	655.00	365.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	Lake Forest Dr.		Lake Forest Dr.		SR-241 SB Ramp	
Base Volume Input [veh/h]	0	1380	1070	0	390	190
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.03	1.96	0.00	2.05	2.11
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	1380	1070	0	390	47
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	345	268	0	98	12
Total Analysis Volume [veh/h]	0	1380	1070	0	390	47
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	60
Lost time [s]	3.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Split	Split
Signal Group	0	2	6	0	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.41	0.31	0.00	0.11	0.03
Intersection LOS	A					
Intersection V/C	0.571					

Intersection Level Of Service Report
Intersection 9:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.763

Intersection Setup

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Approach	Northeastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	1	0	1	1
Pocket Length [ft]	100.00	230.00	390.00	100.00	185.00	145.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Bake Pkwy.		Bake Pkwy.		Rancho Pkwy.	
Base Volume Input [veh/h]	1130	900	420	810	440	350
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.04	2.00	1.90	1.98	2.05	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1130	225	420	810	440	87
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	283	56	105	203	110	22
Total Analysis Volume [veh/h]	1130	225	420	810	440	87
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	4	4
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.33	0.13	0.25	0.24	0.13	0.03
Intersection LOS	C					
Intersection V/C	0.763					

Intersection Level Of Service Report
Intersection 10:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.888

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Approach	Southbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	340.00	100.00	200.00	250.00	100.00	110.00	245.00	100.00	215.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rancho Pkwy.			Rancho Pkwy.		
Base Volume Input [veh/h]	310	780	200	150	920	320	270	530	170	240	1040	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	2.05	2.00	2.00	1.96	1.88	1.85	2.08	1.76	2.08	2.02	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	310	780	50	150	920	80	270	530	42	240	1040	22
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	195	13	38	230	20	68	133	11	60	260	6
Total Analysis Volume [veh/h]	310	780	50	150	920	80	270	530	42	240	1040	22
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.18	0.23	0.03	0.09	0.27	0.05	0.08	0.16	0.02	0.14	0.31	0.01
Intersection LOS	D											
Intersection V/C	0.888											

Intersection Level Of Service Report
Intersection 11:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.854

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	190.00	100.00	190.00	190.00	100.00	80.00	100.00	100.00	100.00	190.00	100.00	180.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.						Rancho Pkwy. S.		
Base Volume Input [veh/h]	400	1690	120	80	1090	180	300	260	150	420	40	490
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.01	1.67	2.50	2.02	2.22	2.00	1.92	2.00	1.90	2.50	2.04
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	400	1690	30	80	1090	45	300	260	150	420	40	490
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	100	423	8	20	273	11	75	65	38	105	10	123
Total Analysis Volume [veh/h]	400	1690	30	80	1090	45	300	260	150	420	40	490
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.24	0.50	0.02	0.05	0.32	0.03	0.09	0.12	0.12	0.12	0.16	0.16
Intersection LOS	D											
Intersection V/C	0.854											

Intersection Level Of Service Report
Intersection 12:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.762

Intersection Setup

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Approach	Northbound			Southbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	0	2	0	1	1	0	2
Pocket Length [ft]	400.00	100.00	100.00	200.00	100.00	100.00	395.00	100.00	260.00	150.00	100.00	170.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Santa Margarita Pkwy.			Portola Pkwy.			El Toro Rd.			El Toro Rd.		
Base Volume Input [veh/h]	330	1160	50	460	2140	690	510	550	480	10	210	230
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.12	1.98	2.00	1.96	2.01	2.03	1.96	2.00	2.08	0.00	1.90	2.17
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	330	1160	50	460	2140	172	510	550	120	10	210	57
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	83	290	13	115	535	43	128	138	30	3	53	14
Total Analysis Volume [veh/h]	330	1160	50	460	2140	172	510	550	120	10	210	57
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.10	0.18	0.18	0.14	0.42	0.10	0.15	0.11	0.07	0.01	0.04	0.02
Intersection LOS	C											
Intersection V/C	0.762											

Intersection Level Of Service Report
Intersection 13:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.677

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Thru	Right	Right2	Left2	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	0	1	0	0
Pocket Length [ft]	285.00	100.00	180.00	285.00	100.00	220.00	345.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Commercentre Dr.			Commercentre Dr.		
Base Volume Input [veh/h]	10	1150	270	230	1620	400	590	400	30	160	260	220
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	1.85	2.17	1.98	2.00	2.03	2.00	3.33	1.88	1.92	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	1150	67	230	1620	100	590	400	30	160	260	220
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	288	17	58	405	25	148	100	8	40	65	55
Total Analysis Volume [veh/h]	10	1150	67	230	1620	100	590	400	30	160	260	220
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	131
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Permis	Protect	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	Lead	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.34	0.04	0.14	0.48	0.06	0.17	0.25	0.25	0.09	0.08	0.14
Intersection LOS	B											
Intersection V/C	0.677											

Intersection Level Of Service Report
Intersection 14:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	2	2	0	1
Pocket Length [ft]	305.00	100.00	155.00	305.00	100.00	150.00	305.00	100.00	225.00	275.00	100.00	275.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Trabuco Rd.			Irvine Blvd.		
Base Volume Input [veh/h]	130	2000	700	410	2010	200	300	340	200	290	640	250
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.31	2.00	2.00	1.95	1.99	2.00	2.00	2.06	2.00	2.07	2.03	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	2000	175	410	2010	50	300	340	12	290	640	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	500	44	103	503	13	75	85	3	73	160	25
Total Analysis Volume [veh/h]	130	2000	175	410	2010	50	300	340	12	290	640	100
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.39	0.10	0.12	0.39	0.03	0.09	0.05	0.01	0.09	0.13	0.06
Intersection LOS	C											
Intersection V/C	0.780											

Intersection Level Of Service Report
Intersection 15:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.713

Intersection Setup

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Approach	Northbound			Northeastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	0	2	0	1
Pocket Length [ft]	210.00	100.00	280.00	275.00	100.00	405.00	160.00	100.00	100.00	175.00	100.00	225.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Trabuco Rd.			Lake Forest Dr.			Lake Forest Dr.			Trabuco Rd.		
Base Volume Input [veh/h]	280	560	350	280	1340	520	380	1140	190	480	1050	170
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	1.96	2.00	2.14	2.01	1.92	2.11	2.02	2.11	2.08	2.00	1.76
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	280	560	87	280	1340	130	380	1140	190	480	1050	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	70	140	22	70	335	33	95	285	48	120	263	11
Total Analysis Volume [veh/h]	280	560	87	280	1340	130	380	1140	190	480	1050	42
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	5	2	2	1	6	6	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.11	0.05	0.08	0.26	0.08	0.11	0.26	0.26	0.14	0.21	0.02
Intersection LOS	C											
Intersection V/C	0.713											

Intersection Level Of Service Report
Intersection 16:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.607

Intersection Setup

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Approach	Southbound		Northeastbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	1	0	0	1	0
Pocket Length [ft]	100.00	200.00	100.00	100.00	190.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Trabuco Rd.		Ridge Route Dr.		Trabuco Rd.	
Base Volume Input [veh/h]	1730	280	210	380	160	940
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.02	2.14	1.90	2.11	1.88	2.02
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1730	70	210	95	160	940
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	433	18	53	24	40	235
Total Analysis Volume [veh/h]	1730	70	210	95	160	940
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Permissive	Permissive	Split	Split	Protected	Permissive
Signal Group	4	4	2	2	3	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lag	-	Lead	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.34	0.04	0.12	0.06	0.09	0.18
Intersection LOS	B					
Intersection V/C	0.607					

Intersection Level Of Service Report
Intersection 17:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	360.00	100.00	305.00	165.00	100.00	175.00	225.00	100.00	230.00	205.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Trabuco Rd.			Trabuco Rd.		
Base Volume Input [veh/h]	300	1250	340	310	1020	280	120	490	260	470	1090	280
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.06	1.94	1.96	2.14	1.67	2.04	1.92	1.91	2.02	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	300	1250	85	310	1020	70	120	490	65	470	1090	280
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	313	21	78	255	18	30	123	16	118	273	70
Total Analysis Volume [veh/h]	300	1250	85	310	1020	70	120	490	65	470	1090	280
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3			6,7						
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.09	0.25	0.01	0.09	0.20	0.00	0.04	0.10	0.04	0.14	0.27	0.27
Intersection LOS	B											
Intersection V/C	0.694											

Intersection Level Of Service Report
Intersection 18:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.823

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	180.00	100.00	205.00	205.00	100.00	225.00	285.00	100.00	100.00	205.00	100.00	110.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	110	2500	430	110	2490	30	60	110	100	230	610	360
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	2.00	2.09	1.82	2.01	3.33	1.67	1.82	2.00	2.17	1.97	1.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	2500	107	110	2490	7	60	110	100	230	610	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	625	27	28	623	2	15	28	25	58	153	23
Total Analysis Volume [veh/h]	110	2500	107	110	2490	7	60	110	100	230	610	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.49	0.06	0.06	0.49	0.00	0.04	0.06	0.06	0.07	0.18	0.05
Intersection LOS	D											
Intersection V/C	0.823											

Intersection Level Of Service Report
Intersection 19:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.690

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Approach	Eastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	185.00	180.00	100.00	200.00	155.00	100.00	100.00	135.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	140	1930	180	40	1280	30	70	70	20	140	530	140
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.02	2.22	2.50	2.03	3.33	1.43	1.43	0.00	2.14	2.08	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	1930	45	40	1280	7	70	70	20	140	530	140
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	483	11	10	320	2	18	18	5	35	133	35
Total Analysis Volume [veh/h]	140	1930	45	40	1280	7	70	70	20	140	530	140
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.38	0.03	0.02	0.25	0.00	0.04	0.03	0.03	0.08	0.20	0.20
Intersection LOS	B											
Intersection V/C	0.690											

Intersection Level Of Service Report
Intersection 20:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.404

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	175.00	100.00	100.00	200.00	100.00	100.00	110.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	30	380	50	90	350	30	50	110	50	130	460	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	2.11	2.00	2.22	2.00	3.33	2.00	1.82	2.00	2.31	1.96	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	380	50	90	350	30	50	110	50	130	460	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	95	13	23	88	8	13	28	13	33	115	8
Total Analysis Volume [veh/h]	30	380	50	90	350	30	50	110	50	130	460	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	157
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.13	0.13	0.05	0.11	0.11	0.03	0.05	0.05	0.08	0.14	0.14
Intersection LOS	A											
Intersection V/C	0.404											

Intersection Level Of Service Report
Intersection 21:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.532

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	250.00	100.00	250.00	210.00	100.00	1000.0	100.00	100.00	25.00	170.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Toledo Way			Toledo Way		
Base Volume Input [veh/h]	90	1690	30	20	1170	90	10	20	20	320	80	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.22	2.01	3.33	0.00	1.97	2.22	0.00	0.00	0.00	1.88	2.50	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	1690	7	20	1170	22	10	20	5	320	80	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	423	2	5	293	6	3	5	1	80	20	10
Total Analysis Volume [veh/h]	90	1690	7	20	1170	22	10	20	5	320	80	40
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.33	0.00	0.01	0.23	0.01	0.01	0.02	0.00	0.09	0.12	0.02
Intersection LOS	A											
Intersection V/C	0.532											

Intersection Level Of Service Report
Intersection 22:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.887

Intersection Setup

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	1	0	1	1	0	0	2	0	1
Pocket Length [ft]	350.00	100.00	190.00	285.00	100.00	200.00	255.00	100.00	100.00	150.00	100.00	80.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Bake Pkwy.			Bake Pkwy.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	40	2720	550	210	2720	50	140	140	90	220	530	450
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	1.99	2.00	1.90	1.99	2.00	2.14	2.14	2.22	1.82	2.08	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	40	2720	137	210	2720	12	140	140	90	220	530	112
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	680	34	53	680	3	35	35	23	55	133	28
Total Analysis Volume [veh/h]	40	2720	137	210	2720	12	140	140	90	220	530	112
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	131
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.53	0.08	0.06	0.53	0.01	0.08	0.07	0.07	0.06	0.16	0.07
Intersection LOS	D											
Intersection V/C	0.887											

Intersection Level Of Service Report
Intersection 23:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.860

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Westbound			Northeastbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	1
Pocket Length [ft]	195.00	100.00	300.00	255.00	100.00	275.00	240.00	100.00	100.00	190.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	180	1210	130	110	1910	300	110	270	90	350	900	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.22	1.98	2.31	1.82	1.99	2.00	1.82	1.85	2.22	2.00	2.00	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	180	1210	32	110	1910	75	110	270	90	350	900	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	45	303	8	28	478	19	28	68	23	88	225	8
Total Analysis Volume [veh/h]	180	1210	32	110	1910	75	110	270	90	350	900	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	1	6	6	5	2	2	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.24	0.02	0.06	0.37	0.04	0.06	0.11	0.11	0.21	0.26	0.02
Intersection LOS	D											
Intersection V/C	0.860											

Intersection Level Of Service Report
Intersection 24:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.588

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	0	1	0	0
Pocket Length [ft]	200.00	100.00	115.00	175.00	100.00	95.00	95.00	100.00	100.00	150.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	60	370	40	130	310	20	60	400	50	100	990	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.67	1.89	2.50	2.31	1.94	0.00	1.67	2.00	2.00	2.00	2.02	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	60	370	10	130	310	5	60	400	50	100	990	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	93	3	33	78	1	15	100	13	25	248	23
Total Analysis Volume [veh/h]	60	370	10	130	310	5	60	400	50	100	990	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	141
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.11	0.01	0.08	0.09	0.00	0.04	0.13	0.13	0.06	0.32	0.32
Intersection LOS	A											
Intersection V/C	0.588											

Intersection Level Of Service Report
Intersection 25:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.853

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	1	0	0
Pocket Length [ft]	195.00	100.00	125.00	360.00	100.00	575.00	155.00	100.00	145.00	180.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	140	1620	440	210	980	30	340	420	210	30	980	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	1.98	2.05	1.90	2.04	3.33	2.06	1.90	1.90	3.33	2.04	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	1620	110	210	980	7	340	420	52	30	980	110
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	405	28	53	245	2	85	105	13	8	245	28
Total Analysis Volume [veh/h]	140	1620	110	210	980	7	340	420	52	30	980	110
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Overla	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups			2,3									
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.32	0.00	0.06	0.19	0.00	0.10	0.12	0.03	0.02	0.32	0.32
Intersection LOS	D											
Intersection V/C	0.853											

Intersection Level Of Service Report
Intersection 26:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.737

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	2	0	1
Pocket Length [ft]	285.00	100.00	100.00	295.00	100.00	110.00	180.00	100.00	175.00	200.00	100.00	200.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Jeronimo Rd.			Jeronimo Rd.		
Base Volume Input [veh/h]	260	1280	340	190	640	170	360	500	190	420	730	270
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.92	2.03	2.06	2.11	2.03	1.76	1.94	2.00	2.11	1.90	2.05	1.85
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	260	1280	85	190	640	42	360	500	47	420	730	67
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	65	320	21	48	160	11	90	125	12	105	183	17
Total Analysis Volume [veh/h]	260	1280	85	190	640	42	360	500	47	420	730	67
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.25	0.05	0.11	0.13	0.02	0.11	0.15	0.03	0.12	0.21	0.04
Intersection LOS	C											
Intersection V/C	0.737											

Intersection Level Of Service Report
Intersection 27:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.789

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	295.00	100.00	285.00	235.00	100.00	290.00	245.00	100.00	210.00	185.00	100.00	255.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	10	1850	540	240	1210	50	210	240	180	280	830	120
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	2.00	2.04	2.08	1.98	2.00	1.90	2.08	2.22	2.14	2.05	1.67
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	1850	135	240	1210	12	210	240	45	280	830	30
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	463	34	60	303	3	53	60	11	70	208	8
Total Analysis Volume [veh/h]	10	1850	135	240	1210	12	210	240	45	280	830	30
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Overla
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.36	0.08	0.07	0.24	0.01	0.06	0.07	0.03	0.08	0.24	0.01
Intersection LOS	C											
Intersection V/C	0.789											

Intersection Level Of Service Report
Intersection 28:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.594

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	185.00	100.00	190.00	175.00	100.00	200.00	180.00	100.00	95.00	300.00	100.00	125.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	140	230	160	210	220	100	40	430	170	170	1120	110
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.14	2.17	1.88	1.90	1.82	2.00	2.50	2.09	1.76	1.76	1.96	1.82
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	230	40	210	220	25	40	430	42	170	1120	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	58	10	53	55	6	10	108	11	43	280	7
Total Analysis Volume [veh/h]	140	230	40	210	220	25	40	430	42	170	1120	27
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.07	0.02	0.12	0.06	0.01	0.02	0.13	0.02	0.10	0.33	0.02
Intersection LOS	A											
Intersection V/C	0.594											

Intersection Level Of Service Report
Intersection 29:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.805

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	2	0	1	2	0	1	2	0	1
Pocket Length [ft]	245.00	100.00	100.00	150.00	100.00	345.00	215.00	100.00	120.00	170.00	100.00	295.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	270	1810	360	80	1160	110	310	330	200	190	960	420
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.85	1.99	1.94	2.50	1.98	1.82	1.94	2.12	2.00	2.11	1.98	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	270	1810	90	80	1160	27	310	330	50	190	960	105
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	68	453	23	20	290	7	78	83	13	48	240	26
Total Analysis Volume [veh/h]	270	1810	90	80	1160	27	310	330	50	190	960	105
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.08	0.35	0.05	0.02	0.23	0.02	0.09	0.10	0.03	0.06	0.28	0.06
Intersection LOS	D											
Intersection V/C	0.805											

Intersection Level Of Service Report
Intersection 30:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	1	2	0	1	2	0	0
Pocket Length [ft]	210.00	100.00	410.00	190.00	100.00	125.00	250.00	100.00	145.00	305.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Muirlands Blvd.			Muirlands Blvd.		
Base Volume Input [veh/h]	150	1250	270	270	770	170	100	480	220	410	640	210
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	1.85	1.85	1.95	1.76	2.00	2.08	1.82	1.95	2.03	1.90
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	1250	67	270	770	42	100	480	220	410	640	210
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	313	17	68	193	11	25	120	55	103	160	53
Total Analysis Volume [veh/h]	150	1250	67	270	770	42	100	480	220	410	640	210
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	2	2	1	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.25	0.04	0.08	0.15	0.02	0.03	0.14	0.13	0.12	0.25	0.25
Intersection LOS	B											
Intersection V/C	0.658											

Intersection Level Of Service Report
Intersection 31:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.880

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	2	0	1	2	0	1	2	0	2
Pocket Length [ft]	225.00	100.00	290.00	165.00	100.00	180.00	260.00	100.00	155.00	145.00	100.00	250.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	410	2370	680	380	1440	220	390	330	320	430	460	510
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.95	1.98	2.06	2.11	2.01	1.82	2.05	2.12	1.88	2.09	1.96	1.96
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	410	2370	170	380	1440	220	390	330	320	430	460	127
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	103	593	43	95	360	55	98	83	80	108	115	32
Total Analysis Volume [veh/h]	410	2370	170	380	1440	220	390	330	320	430	460	127
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	140
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.12	0.46	0.10	0.11	0.24	0.24	0.11	0.13	0.13	0.13	0.14	0.00
Intersection LOS	D											
Intersection V/C	0.880											

Intersection Level Of Service Report
Intersection 32:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.730

Intersection Setup

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	155.00	100.00	100.00	100.00	170.00	100.00	100.00	255.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			No			Yes		

Volumes

Name	Ridge Route Dr.			Ridge Route Dr.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	70	60	50	120	70	160	50	570	140	550	1310	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.43	1.67	2.00	1.67	1.43	1.88	2.00	1.93	2.14	2.00	1.98	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	70	60	12	120	70	160	50	570	140	550	1310	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	15	3	30	18	40	13	143	35	138	328	23
Total Analysis Volume [veh/h]	70	60	12	120	70	160	50	570	140	550	1310	90
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	5	5	5	6	6	6	3	8	8	7	4	4
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.04	0.01	0.07	0.10	0.10	0.03	0.21	0.21	0.32	0.41	0.41
Intersection LOS	C											
Intersection V/C	0.730											

Intersection Level Of Service Report
Intersection 33:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	2	0	1	2	0	1
Pocket Length [ft]	250.00	100.00	235.00	200.00	100.00	100.00	195.00	100.00	200.00	245.00	100.00	155.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	740	2280	630	260	1420	70	530	200	130	110	290	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.03	2.02	2.06	1.92	1.97	1.43	2.08	2.00	2.31	1.82	2.07	1.91
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	740	2280	157	260	1420	70	530	200	32	110	290	117
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	185	570	39	65	355	18	133	50	8	28	73	29
Total Analysis Volume [veh/h]	740	2280	157	260	1420	70	530	200	32	110	290	117
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Unsign
Signal Group	5	2	2	1	6	6	3	8	8	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.22	0.34	0.09	0.08	0.22	0.22	0.16	0.06	0.02	0.03	0.09	0.00
Intersection LOS	C											
Intersection V/C	0.731											

Intersection Level Of Service Report
Intersection 34:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.592

Intersection Setup

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	200.00	100.00	100.00	160.00	100.00	160.00	100.00	100.00	50.00	250.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Los Alisos Blvd.			Los Alisos Blvd.			Rockfield Blvd.			Rockfield Blvd.		
Base Volume Input [veh/h]	250	1040	10	20	690	250	10	30	20	550	30	260
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.02	0.00	0.00	2.03	2.00	0.00	3.33	0.00	2.00	3.33	1.92
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	250	1040	10	20	690	62	10	30	20	550	30	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	63	260	3	5	173	16	3	8	5	138	8	16
Total Analysis Volume [veh/h]	250	1040	10	20	690	62	10	30	20	550	30	65
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	130
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.15	0.31	0.31	0.01	0.20	0.04	0.01	0.02	0.02	0.16	0.17	0.04
Intersection LOS	A											
Intersection V/C	0.592											

Intersection Level Of Service Report
Intersection 35:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.618

Intersection Setup

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Approach	Northbound			Eastbound			Southwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	640.00	100.00	640.00	190.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			0.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name	I-5 NB Ramps			Lake Forest Dr.			Lake Forest Dr.			I-5 NB Ramps		
Base Volume Input [veh/h]	360	0	780	0	3160	0	0	1290	1090	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	0.00	2.05	0.00	1.99	0.00	0.00	2.02	2.02	0.00	0.00	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	360	0	195	0	3160	0	0	1290	272	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	0	49	0	790	0	0	323	68	0	0	0
Total Analysis Volume [veh/h]	360	0	195	0	3160	0	0	1290	272	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis
Signal Group	8	0	8	0	2	0	0	6	0	0	0	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	-	-	-	-	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.11	0.00	0.06	0.00	0.46	0.00	0.00	0.25	0.16	0.00	0.00	0.00
Intersection LOS	B											
Intersection V/C	0.618											

Intersection Level Of Service Report
Intersection 36:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.901

Intersection Setup

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	1	0	0	1	0	0	1
Pocket Length [ft]	125.00	100.00	125.00	100.00	100.00	250.00	100.00	100.00	100.00	100.00	100.00	465.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			No		

Volumes

Name	Avenida De La Carlota			I-5 SB Ramps			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	170	0	460	1990	470	610	0	2500	170	350	870	620
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.76	0.00	1.96	2.01	1.91	1.97	0.00	2.00	1.76	2.00	1.95	1.94
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	170	0	460	1990	470	152	0	2500	42	350	870	155
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	0	115	498	118	38	0	625	11	88	218	39
Total Analysis Volume [veh/h]	170	0	460	1990	470	152	0	2500	42	350	870	155
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	127
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Permis	Permis	Permis	Protect	Permis	Permis
Signal Group	8	0	8	4	4	4	0	2	2	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	-	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.09	0.29	0.28	0.09	0.00	0.37	0.02	0.10	0.17	0.09
Intersection LOS	E											
Intersection V/C	0.901											

Intersection Level Of Service Report
Intersection 37:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.621

Intersection Setup

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	2	1	0	1	2	0	1
Pocket Length [ft]	145.00	100.00	100.00	100.00	100.00	265.00	35.00	100.00	120.00	135.00	100.00	45.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Paseo De La Valencia			I-5 SB Ramps			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	80	100	110	1240	430	30	20	480	610	220	960	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.50	2.00	1.82	2.02	2.09	3.33	0.00	2.08	1.97	1.82	1.98	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	80	100	27	1240	430	30	20	480	152	220	960	340
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	25	7	310	108	8	5	120	38	55	240	85
Total Analysis Volume [veh/h]	80	100	27	1240	430	30	20	480	152	220	960	340
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Permis	Permis	Overla	Split	Split	Split	Protect	Permis	Protect	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	8	1	6	6
Auxiliary Signal Groups			4,5									
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.06	0.00	0.24	0.25	0.25	0.01	0.14	0.09	0.06	0.28	0.20
Intersection LOS	B											
Intersection V/C	0.621											

Intersection Level Of Service Report
Intersection 38:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.821

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	1	1	0	1
Pocket Length [ft]	110.00	100.00	100.00	85.00	100.00	100.00	100.00	100.00	410.00	165.00	100.00	165.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			I-5 NB Ramps			Bridger Rd.		
Base Volume Input [veh/h]	100	2860	900	0	2400	110	500	70	810	130	10	280
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	1.99	2.00	0.00	2.00	1.82	2.00	1.43	1.98	2.31	0.00	2.14
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	2860	225	0	2400	110	500	70	810	130	10	280
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	715	56	0	600	28	125	18	203	33	3	70
Total Analysis Volume [veh/h]	100	2860	225	0	2400	110	500	70	810	130	10	280
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	150
Lost time [s]	8.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Permis	Permis	Overla
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												4,5
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.42	0.13	0.00	0.30	0.30	0.15	0.27	0.27	0.08	0.01	0.11
Intersection LOS	D											
Intersection V/C	0.821											

Intersection Level Of Service Report
Intersection 39:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.780

Intersection Setup

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	2	0	1	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	305.00	100.00	135.00	215.00	100.00	100.00	215.00	100.00	90.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	El Toro Rd.			El Toro Rd.			Avenida De La Carlota			Avenida De La Carlota		
Base Volume Input [veh/h]	0	2310	50	290	1180	870	60	180	580	1520	740	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	1.99	2.00	2.07	2.03	1.95	1.67	2.22	2.07	1.97	2.03	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	2310	50	290	1180	217	60	180	145	1520	740	5
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	578	13	73	295	54	15	45	36	380	185	1
Total Analysis Volume [veh/h]	0	2310	50	290	1180	217	60	180	145	1520	740	5
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Protect	Permis	Permis	Permis	Permis	Overla	Split	Split	Split
Signal Group	0	2	2	1	6	6	8	8	1	4	4	4
Auxiliary Signal Groups									1,8			
Lead / Lag	-	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.35	0.35	0.09	0.23	0.13	0.04	0.14	0.00	0.30	0.22	0.00
Intersection LOS	C											
Intersection V/C	0.780											

Intersection Level Of Service Report
Intersection 40:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.813

Intersection Setup

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Approach	Northbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	1	2	0	0	0	0	1	1	0	0
Pocket Length [ft]	295.00	100.00	195.00	135.00	100.00	100.00	100.00	100.00	95.00	165.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			Yes			Yes			Yes		

Volumes

Name	Portola Pkwy.			Portola Pkwy.			Purpose Dr.			Rancho Pkwy.		
Base Volume Input [veh/h]	720	1120	10	30	1640	220	20	30	30	350	60	1530
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	1.96	0.00	3.33	2.01	1.82	0.00	3.33	3.33	2.00	1.67	2.03
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	720	1120	2	30	1640	55	20	30	7	350	60	382
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	180	280	1	8	410	14	5	8	2	88	15	96
Total Analysis Volume [veh/h]	720	1120	2	30	1640	55	20	30	7	350	60	382
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	182
Lost time [s]	9.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Protect	Permis	Permis	Permis	Split	Split	Split
Signal Group	5	2	2	1	6	4	8	8	1	4	4	0
Auxiliary Signal Groups									1,8			
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.22	0.00	0.01	0.32	0.03	0.01	0.01	0.00	0.10	0.12	0.22
Intersection LOS	D											
Intersection V/C	0.813											

Intersection Level Of Service Report
Intersection 41:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.535

Intersection Setup

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Approach	Southbound			Northeastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	2	0	1	1	0	1
Pocket Length [ft]	200.00	100.00	205.00	225.00	100.00	230.00	260.00	100.00	155.00	245.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Towne Centre Dr.			Alton Pkwy.			Alton Pkwy.			Rancho Pkwy. S.		
Base Volume Input [veh/h]	30	80	150	150	1540	160	50	870	50	240	70	180
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	2.50	2.00	2.00	2.01	1.88	2.00	1.95	2.00	2.08	1.43	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	80	37	150	1540	40	50	870	12	240	70	45
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	20	9	38	385	10	13	218	3	60	18	11
Total Analysis Volume [veh/h]	30	80	37	150	1540	40	50	870	12	240	70	45
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	111
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	7	4	4	5	2	2	1	6	6	3	8	8
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.02	0.02	0.09	0.30	0.02	0.01	0.17	0.01	0.14	0.02	0.03
Intersection LOS	A											
Intersection V/C	0.535											

Intersection Level Of Service Report
Intersection 42:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.816

Intersection Setup

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Approach	Eastbound		Southwestbound		Northwestbound	
Lane Configuration						
Turning Movement	Thru	Right	Left	Thru	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	2	0
Pocket Length [ft]	100.00	100.00	305.00	100.00	260.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		Yes		Yes	

Volumes

Name	Alton Pkwy.		Alton Pkwy.		Commercentre Dr.	
Base Volume Input [veh/h]	1710	480	100	1070	930	340
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.99	2.08	2.00	1.96	2.04	2.06
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1710	480	100	1070	930	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	428	120	25	268	233	21
Total Analysis Volume [veh/h]	1710	480	100	1070	930	85
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	110
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Split	Split
Signal Group	2	2	1	6	8	8
Auxiliary Signal Groups						
Lead / Lag	-	-	Lead	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.43	0.43	0.06	0.21	0.27	0.05
Intersection LOS	D					
Intersection V/C	0.816					

Intersection Level Of Service Report
Intersection 51:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.463

Intersection Setup

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Approach	Eastbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	0	0	0
Pocket Length [ft]	100.00	100.00	255.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

Volumes

Name	Glenn Ranch Rd.		El Toro Rd.		El Toro Rd.	
Base Volume Input [veh/h]	360	140	130	870	560	90
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.94	2.14	2.31	1.95	1.96	2.22
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	360	35	130	870	560	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	9	33	218	140	23
Total Analysis Volume [veh/h]	360	35	130	870	560	90
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Permissive	Overlap	Protected	Permissive	Permissive	Permissive
Signal Group	7	5	5	2	6	6
Auxiliary Signal Groups		5				
Lead / Lag	Lag	-	Lead	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.21	0.00	0.08	0.17	0.13	0.13
Intersection LOS	A					
Intersection V/C	0.463					

Intersection Level Of Service Report
Intersection 56:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.883

Intersection Setup

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Approach	Northbound			Southbound			Eastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	2	1	0	1	1	0	1
Pocket Length [ft]	170.00	100.00	170.00	100.00	100.00	165.00	290.00	100.00	225.00	295.00	100.00	205.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Dimension Dr.			Bake Pkwy.			Bake Pkwy.		
Base Volume Input [veh/h]	220	200	410	30	70	50	190	1520	160	420	1060	160
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	2.00	1.95	3.33	1.43	2.00	2.11	1.97	1.88	1.90	1.98	1.88
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	220	200	102	30	70	12	190	1520	40	420	1060	40
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	55	50	26	8	18	3	48	380	10	105	265	10
Total Analysis Volume [veh/h]	220	200	102	30	70	12	190	1520	40	420	1060	40
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	131
Lost time [s]	7.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	3	8	8	7	4	4	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.12	0.06	0.02	0.04	0.01	0.11	0.45	0.02	0.25	0.31	0.02
Intersection LOS	D											
Intersection V/C	0.883											

Intersection Level Of Service Report
Intersection 57:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

Intersection Setup

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	1	0	0	1	1	0	0
Pocket Length [ft]	140.00	100.00	175.00	105.00	100.00	200.00	100.00	100.00	35.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			Yes			Yes		

Volumes

Name	Lake Forest Dr.			Lake Forest Dr.			Dimension Dr.			Dimension Dr.		
Base Volume Input [veh/h]	340	870	30	60	770	420	30	10	20	680	20	330
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.06	1.95	3.33	1.67	1.95	1.90	3.33	0.00	0.00	2.06	0.00	2.12
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	340	870	7	60	770	105	30	10	20	680	20	82
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	85	218	2	15	193	26	8	3	5	170	5	21
Total Analysis Volume [veh/h]	340	870	7	60	770	105	30	10	20	680	20	82
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Protect	Permis	Permis	Split	Split	Split	Split	Split	Split
Signal Group	5	2	2	1	6	6	8	8	8	4	4	4
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lag	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.20	0.26	0.00	0.04	0.23	0.06	0.02	0.02	0.02	0.20	0.21	0.05
Intersection LOS	B											
Intersection V/C	0.700											

Intersection Level Of Service Report
Intersection 60:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.885

Intersection Setup

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Approach	Southbound			Eastbound			Southwestbound			Northwestbound		
Lane Configuration												
Turning Movement	Left2	Left	Right	Left2	Left	Thru	Left	Thru	Right	Thru	Right	Right2
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	210.00	100.00	100.00	140.00	100.00	100.00	210.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Dimension Dr.			Commercentre Dr.			Enterprise Way			Dimension Dr.		
Base Volume Input [veh/h]	30	660	110	160	10	740	300	220	40	290	390	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	3.33	1.97	1.82	1.88	0.00	2.03	2.00	1.82	2.50	2.07	2.05	0.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	660	110	160	10	740	300	220	40	290	390	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	165	28	40	3	185	75	55	10	73	98	5
Total Analysis Volume [veh/h]	30	660	110	160	10	740	300	220	40	290	390	20
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	129
Lost time [s]	6.00

Phasing & Timing

Control Type	Protect	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis
Signal Group	1	6	6	4	4	4	8	8	8	5	2	2
Auxiliary Signal Groups												
Lead / Lag	Lead	Lag	-	Lag	Lag	-	Lag	-	-	-	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.19	0.23	0.09	0.01	0.44	0.18	0.15	0.15	0.17	0.12	0.12
Intersection LOS	D											
Intersection V/C	0.885											

Intersection Level Of Service Report
Intersection 101:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.509

Intersection Setup

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Approach	Eastbound			Westbound			Northeastbound			Southwestbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	1	0	1	1	0	1
Pocket Length [ft]	65.00	100.00	100.00	60.00	100.00	100.00	150.00	100.00	190.00	155.00	100.00	195.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Pittsford			Pittsford			Lake Forest Dr.			Lake Forest Dr.		
Base Volume Input [veh/h]	20	10	10	100	20	110	30	1100	400	80	970	30
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	2.00	0.00	1.82	3.33	2.00	2.00	2.50	1.96	3.33
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	10	10	100	20	110	30	1100	100	80	970	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	3	3	25	5	28	8	275	25	20	243	2
Total Analysis Volume [veh/h]	20	10	10	100	20	110	30	1100	100	80	970	7
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Cycle Length [s]	100
Lost time [s]	5.00

Phasing & Timing

Control Type	Permis	Permis	Permis	Permis	Permis	Permis	Protect	Permis	Permis	Protect	Permis	Permis
Signal Group	4	4	4	8	8	8	5	2	2	1	6	6
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.06	0.08	0.08	0.02	0.32	0.06	0.05	0.29	0.00
Intersection LOS	A											
Intersection V/C	0.509											

Intersection Level Of Service Report
Intersection 102:

Control Type:	Signalized	Delay (sec / veh):	-
Analysis Method:	ICU 1	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.388

Intersection Setup

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	1	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

Volumes

Name	El Toro Rd.		El Toro Rd.		Northcrest Dr.	
Base Volume Input [veh/h]	110	1620	1130	40	40	70
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.82	1.98	2.04	2.50	2.50	1.43
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	1620	1130	40	40	17
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	405	283	10	10	4
Total Analysis Volume [veh/h]	110	1620	1130	40	40	17
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Cycle Length [s]	128
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Permissive	Permissive	Permissive	Permissive	Overlap
Signal Group	5	2	6	6	7	5
Auxiliary Signal Groups						5
Lead / Lag	Lead	-	-	-	Lag	-

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.32	0.23	0.23	0.02	0.00
Intersection LOS	A					
Intersection V/C	0.388					

Lake Forest GPU (2040 Improvements PM)

Vistro File: H:\...\2040_Constrained_PM-mit.vistro
Report File: H:\...\2040ImprovedAM.pdf

Scenario: Base Scenario
10/11/2019

Turning Movement Volume: Summary

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		200	270	630	150	110	30	470	190	240	10	240	180	2720

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		230	350	350	360	250	110	410	760	100	230	650	150	3950

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		270	310	460	130	290	30	320	1030	180	10	1110	220	4360

ID	Intersection Name	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
		Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		110	920	880	650	80	400	130	80	180	900	1450	120	5900

ID	Intersection Name	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		520	1610	300	80	1200	170	130	200	490	260	4960

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		460	1080	60	100	680	570	50	60	720	350	4130

ID	Intersection Name	Northbound		Southwestbound		Total Volume
		Left	Thru	Thru	Right	
7		230	1400	1010	470	3110

ID	Intersection Name	Northbound	Southbound	Southeastbound		Total Volume
		Thru	Thru	Left	Right	
8		1380	1070	390	190	3030

ID	Intersection Name	Northeastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
9		1130	900	420	810	440	350	4050

ID	Intersection Name	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		310	780	200	150	920	320	270	530	170	240	1040	90	5020

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		400	1690	120	80	1090	180	300	260	150	420	40	490	5220

ID	Intersection Name	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		330	1160	50	460	2140	690	510	550	480	10	210	230	6820

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		10	1150	270	230	1620	400	590	400	30	160	260	220	5340

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		130	2000	700	410	2010	200	300	340	200	290	640	250	7470

ID	Intersection Name	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		280	560	350	280	1340	520	380	1140	190	480	1050	170	6740

ID	Intersection Name	Southbound		Northeastbound		Northwestbound		Total Volume
		Thru	Right	Left	Right	Left	Thru	
16		1730	280	210	380	160	940	3700

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		300	1250	340	310	1020	280	120	490	260	470	1090	280	6210

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		110	2500	430	110	2490	30	60	110	100	230	610	360	7140

ID	Intersection Name	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		140	1930	180	40	1280	30	70	70	20	140	530	140	4570

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		30	380	50	90	350	30	50	110	50	130	460	30	1760

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		90	1690	30	20	1170	90	10	20	20	320	80	160	3700

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		40	2720	550	210	2720	50	140	140	90	220	530	450	7860

ID	Intersection Name	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		180	1210	130	110	1910	300	110	270	90	350	900	120	5680

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		60	370	40	130	310	20	60	400	50	100	990	90	2620

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		140	1620	440	210	980	30	340	420	210	30	980	110	5510

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		260	1280	340	190	640	170	360	500	190	420	730	270	5350

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		10	1850	540	240	1210	50	210	240	180	280	830	120	5760

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		140	230	160	210	220	100	40	430	170	170	1120	110	3100

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		270	1810	360	80	1160	110	310	330	200	190	960	420	6200

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		150	1250	270	270	770	170	100	480	220	410	640	210	4940

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		410	2370	680	380	1440	220	390	330	320	430	460	510	7940

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		70	60	50	120	70	160	50	570	140	550	1310	90	3240

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		740	2280	630	260	1420	70	530	200	130	110	290	470	7130

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		250	1040	10	20	690	250	10	30	20	550	30	260	3160

ID	Intersection Name	Northbound		Eastbound	Southwestbound		Total Volume
		Left	Right	Thru	Thru	Right	
35		360	780	3160	1290	1090	6680

ID	Intersection Name	Northbound		Southbound			Eastbound		Westbound			Total Volume
		Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		170	460	1990	470	610	2500	170	350	870	620	8210

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		80	100	110	1240	430	30	20	480	610	220	960	340	4620

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		100	2860	900	0	2400	110	500	70	810	130	10	280	8170

ID	Intersection Name	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
		Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		2310	50	290	1180	870	60	180	580	1520	740	20	7800

ID	Intersection Name	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		720	1120	10	30	1640	220	20	30	30	350	60	1530	5760

ID	Intersection Name	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		30	80	150	150	1540	160	50	870	50	240	70	180	3570

ID	Intersection Name	Eastbound		Southwestbound		Northwestbound		Total Volume
		Thru	Right	Left	Thru	Left	Right	
42		1710	480	100	1070	930	340	4630

ID	Intersection Name	Eastbound		Northeastbound		Southwestbound		Total Volume
		Left	Right	Left	Thru	Thru	Right	
51		360	140	130	870	560	90	2150

ID	Intersection Name	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		220	200	410	30	70	50	190	1520	160	420	1060	160	4490

ID	Intersection Name	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		340	870	30	60	770	420	30	10	20	680	20	330	3580

ID	Intersection Name	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
		2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		30	660	110	160	10	740	300	220	40	290	390	20	2970

ID	Intersection Name	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		20	10	10	100	20	110	30	1100	400	80	970	30	2880

ID	Intersection Name	Northeastbound		Southwestbound		Southeastbound		Total Volume
		Left	Thru	Thru	Right	Left	Right	
102		110	1620	1130	40	40	70	3010

Lake Forest GPU (2040 Improvements PM)

Vistro File: H:\...\2040_Constrained_PM-mit.vistro
Report File: H:\...\2040ImprovedAM.pdf

Scenario: Base Scenario
10/11/2019

Turning Movement Volume: Detail

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1		Final Base	200	270	630	150	110	30	470	190	240	10	240	180	2720
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**200**	**270**	**630**	**150**	**110**	**30**	**470**	**190**	**240**	**10**	**240**	**180**	**2720**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2		Final Base	230	350	350	360	250	110	410	760	100	230	650	150	3950
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**230**	**350**	**350**	**360**	**250**	**110**	**410**	**760**	**100**	**230**	**650**	**150**	**3950**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
3		Final Base	270	310	460	130	290	30	320	1030	180	10	1110	220	4360
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**270**	**310**	**460**	**130**	**290**	**30**	**320**	**1030**	**180**	**10**	**1110**	**220**	**4360**

ID	Intersection Name	Volume Type	Northbound			Westbound			Northeastbound			Southeastbound			Total Volume
			Left	Thru	Right	2	Left	Thru	Left	Thru	Right	Left	Thru	Right	
4		Final Base	110	920	880	650	80	400	130	80	180	900	1450	120	5900
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**920**	**880**	**650**	**80**	**400**	**130**	**80**	**180**	**900**	**1450**	**120**	**5900**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
5		Final Base	520	1610	300	80	1200	170	130	200	490	260	4960
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**520**	**1610**	**300**	**80**	**1200**	**170**	**130**	**200**	**490**	**260**	**4960**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound		Southeastbound		Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Right	Left	Right	
6		Final Base	460	1080	60	100	680	570	50	60	720	350	4130
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**460**	**1080**	**60**	**100**	**680**	**570**	**50**	**60**	**720**	**350**	**4130**

ID	Intersection Name	Volume Type	Northbound		Southwestbound		Total Volume
			Left	Thru	Thru	Right	
7		Final Base	230	1400	1010	470	3110
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**230**	**1400**	**1010**	**470**	**3110**

ID	Intersection Name	Volume Type	Northbound	Southbound	Southeastbound		Total Volume
			Thru	Thru	Left	Right	
8		Final Base	1380	1070	390	190	3030
		Growth Factor	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0
		Net New Trips	0	0	0	0	0
		Other	0	0	0	0	0
		Future Total	**1380**	**1070**	**390**	**190**	**3030**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
9		Final Base	1130	900	420	810	440	350	4050
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1130**	**900**	**420**	**810**	**440**	**350**	**4050**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
10		Final Base	310	780	200	150	920	320	270	530	170	240	1040	90	5020
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**310**	**780**	**200**	**150**	**920**	**320**	**270**	**530**	**170**	**240**	**1040**	**90**	**5020**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
11		Final Base	400	1690	120	80	1090	180	300	260	150	420	40	490	5220
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**400**	**1690**	**120**	**80**	**1090**	**180**	**300**	**260**	**150**	**420**	**40**	**490**	**5220**

ID	Intersection Name	Volume Type	Northbound			Southbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
12		Final Base	330	1160	50	460	2140	690	510	550	480	10	210	230	6820
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**330**	**1160**	**50**	**460**	**2140**	**690**	**510**	**550**	**480**	**10**	**210**	**230**	**6820**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Thru	Right	2	2	Left	Right	
13		Final Base	10	1150	270	230	1620	400	590	400	30	160	260	220	5340
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**1150**	**270**	**230**	**1620**	**400**	**590**	**400**	**30**	**160**	**260**	**220**	**5340**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
14		Final Base	130	2000	700	410	2010	200	300	340	200	290	640	250	7470
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**130**	**2000**	**700**	**410**	**2010**	**200**	**300**	**340**	**200**	**290**	**640**	**250**	**7470**

ID	Intersection Name	Volume Type	Northbound			Northeastbound			Southwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
15		Final Base	280	560	350	280	1340	520	380	1140	190	480	1050	170	6740
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**280**	**560**	**350**	**280**	**1340**	**520**	**380**	**1140**	**190**	**480**	**1050**	**170**	**6740**

ID	Intersection Name	Volume Type	Southbound		Northeastbound		Northwestbound		Total Volume
			Thru	Right	Left	Right	Left	Thru	
16		Final Base	1730	280	210	380	160	940	3700
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1730**	**280**	**210**	**380**	**160**	**940**	**3700**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17		Final Base	300	1250	340	310	1020	280	120	490	260	470	1090	280	6210
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**300**	**1250**	**340**	**310**	**1020**	**280**	**120**	**490**	**260**	**470**	**1090**	**280**	**6210**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18		Final Base	110	2500	430	110	2490	30	60	110	100	230	610	360	7140
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**110**	**2500**	**430**	**110**	**2490**	**30**	**60**	**110**	**100**	**230**	**610**	**360**	**7140**

ID	Intersection Name	Volume Type	Eastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
19		Final Base	140	1930	180	40	1280	30	70	70	20	140	530	140	4570
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**1930**	**180**	**40**	**1280**	**30**	**70**	**70**	**20**	**140**	**530**	**140**	**4570**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
20		Final Base	30	380	50	90	350	30	50	110	50	130	460	30	1760
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**380**	**50**	**90**	**350**	**30**	**50**	**110**	**50**	**130**	**460**	**30**	**1760**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
21		Final Base	90	1690	30	20	1170	90	10	20	20	320	80	160	3700
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**90**	**1690**	**30**	**20**	**1170**	**90**	**10**	**20**	**20**	**320**	**80**	**160**	**3700**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22		Final Base	40	2720	550	210	2720	50	140	140	90	220	530	450	7860
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**40**	**2720**	**550**	**210**	**2720**	**50**	**140**	**140**	**90**	**220**	**530**	**450**	**7860**

ID	Intersection Name	Volume Type	Westbound			Northeastbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
23		Final Base	180	1210	130	110	1910	300	110	270	90	350	900	120	5680
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**180**	**1210**	**130**	**110**	**1910**	**300**	**110**	**270**	**90**	**350**	**900**	**120**	**5680**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
24		Final Base	60	370	40	130	310	20	60	400	50	100	990	90	2620
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**60**	**370**	**40**	**130**	**310**	**20**	**60**	**400**	**50**	**100**	**990**	**90**	**2620**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
25		Final Base	140	1620	440	210	980	30	340	420	210	30	980	110	5510
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**1620**	**440**	**210**	**980**	**30**	**340**	**420**	**210**	**30**	**980**	**110**	**5510**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
26		Final Base	260	1280	340	190	640	170	360	500	190	420	730	270	5350
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**260**	**1280**	**340**	**190**	**640**	**170**	**360**	**500**	**190**	**420**	**730**	**270**	**5350**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
27		Final Base	10	1850	540	240	1210	50	210	240	180	280	830	120	5760
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**10**	**1850**	**540**	**240**	**1210**	**50**	**210**	**240**	**180**	**280**	**830**	**120**	**5760**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
28		Final Base	140	230	160	210	220	100	40	430	170	170	1120	110	3100
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**140**	**230**	**160**	**210**	**220**	**100**	**40**	**430**	**170**	**170**	**1120**	**110**	**3100**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
29		Final Base	270	1810	360	80	1160	110	310	330	200	190	960	420	6200
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**270**	**1810**	**360**	**80**	**1160**	**110**	**310**	**330**	**200**	**190**	**960**	**420**	**6200**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
30		Final Base	150	1250	270	270	770	170	100	480	220	410	640	210	4940
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**150**	**1250**	**270**	**270**	**770**	**170**	**100**	**480**	**220**	**410**	**640**	**210**	**4940**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31		Final Base	410	2370	680	380	1440	220	390	330	320	430	460	510	7940
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**410**	**2370**	**680**	**380**	**1440**	**220**	**390**	**330**	**320**	**430**	**460**	**510**	**7940**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
32		Final Base	70	60	50	120	70	160	50	570	140	550	1310	90	3240
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**70**	**60**	**50**	**120**	**70**	**160**	**50**	**570**	**140**	**550**	**1310**	**90**	**3240**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
33		Final Base	740	2280	630	260	1420	70	530	200	130	110	290	470	7130
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**740**	**2280**	**630**	**260**	**1420**	**70**	**530**	**200**	**130**	**110**	**290**	**470**	**7130**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
34		Final Base	250	1040	10	20	690	250	10	30	20	550	30	260	3160
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**250**	**1040**	**10**	**20**	**690**	**250**	**10**	**30**	**20**	**550**	**30**	**260**	**3160**

ID	Intersection Name	Volume Type	Northbound		Eastbound	Southwestbound		Total Volume
			Left	Right	Thru	Thru	Right	
35		Final Base	360	780	3160	1290	1090	6680
		Growth Factor	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0
		Other	0	0	0	0	0	0
		Future Total	**360**	**780**	**3160**	**1290**	**1090**	**6680**

ID	Intersection Name	Volume Type	Northbound		Southbound			Eastbound		Westbound			Total Volume
			Left	Right	Left	Thru	Right	Thru	Right	Left	Thru	Right	
36		Final Base	170	460	1990	470	610	2500	170	350	870	620	8210
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**170**	**460**	**1990**	**470**	**610**	**2500**	**170**	**350**	**870**	**620**	**8210**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
37		Final Base	80	100	110	1240	430	30	20	480	610	220	960	340	4620
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**80**	**100**	**110**	**1240**	**430**	**30**	**20**	**480**	**610**	**220**	**960**	**340**	**4620**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
38		Final Base	100	2860	900	0	2400	110	500	70	810	130	10	280	8170
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**100**	**2860**	**900**	**0**	**2400**	**110**	**500**	**70**	**810**	**130**	**10**	**280**	**8170**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound			Northwestbound			Southeastbound			Total Volume
			Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
39		Final Base	2310	50	290	1180	870	60	180	580	1520	740	20	7800
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**2310**	**50**	**290**	**1180**	**870**	**60**	**180**	**580**	**1520**	**740**	**20**	**7800**

ID	Intersection Name	Volume Type	Northbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
40		Final Base	720	1120	10	30	1640	220	20	30	30	350	60	1530	5760
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**720**	**1120**	**10**	**30**	**1640**	**220**	**20**	**30**	**30**	**350**	**60**	**1530**	**5760**

ID	Intersection Name	Volume Type	Southbound			Northeastbound			Southwestbound			Northwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
41		Final Base	30	80	150	150	1540	160	50	870	50	240	70	180	3570
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**80**	**150**	**150**	**1540**	**160**	**50**	**870**	**50**	**240**	**70**	**180**	**3570**

ID	Intersection Name	Volume Type	Eastbound		Southwestbound		Northwestbound		Total Volume
			Thru	Right	Left	Thru	Left	Right	
42		Final Base	1710	480	100	1070	930	340	4630
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**1710**	**480**	**100**	**1070**	**930**	**340**	**4630**

ID	Intersection Name	Volume Type	Eastbound		Northeastbound		Southwestbound		Total Volume
			Left	Right	Left	Thru	Thru	Right	
51		Final Base	360	140	130	870	560	90	2150
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**360**	**140**	**130**	**870**	**560**	**90**	**2150**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
56		Final Base	220	200	410	30	70	50	190	1520	160	420	1060	160	4490
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**220**	**200**	**410**	**30**	**70**	**50**	**190**	**1520**	**160**	**420**	**1060**	**160**	**4490**

ID	Intersection Name	Volume Type	Northeastbound			Southwestbound			Northwestbound			Southeastbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
57		Final Base	340	870	30	60	770	420	30	10	20	680	20	330	3580
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**340**	**870**	**30**	**60**	**770**	**420**	**30**	**10**	**20**	**680**	**20**	**330**	**3580**

ID	Intersection Name	Volume Type	Southbound			Eastbound			Southwestbound			Northwestbound			Total Volume
			2	Left	Right	2	Left	Thru	Left	Thru	Right	Thru	Right	2	
60		Final Base	30	660	110	160	10	740	300	220	40	290	390	20	2970
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**30**	**660**	**110**	**160**	**10**	**740**	**300**	**220**	**40**	**290**	**390**	**20**	**2970**

ID	Intersection Name	Volume Type	Eastbound			Westbound			Northeastbound			Southwestbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
101		Final Base	20	10	10	100	20	110	30	1100	400	80	970	30	2880
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	**20**	**10**	**10**	**100**	**20**	**110**	**30**	**1100**	**400**	**80**	**970**	**30**	**2880**

ID	Intersection Name	Volume Type	Northeastbound		Southwestbound		Southeastbound		Total Volume
			Left	Thru	Thru	Right	Left	Right	
102		Final Base	110	1620	1130	40	40	70	3010
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0
		Future Total	**110**	**1620**	**1130**	**40**	**40**	**70**	**3010**

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	490	0	260	130	0	200	80	1200	170	520	1610	300
Future Volume (veh/h)	490	0	260	130	0	200	80	1200	170	520	1610	300
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	516	0	0	137	0	0	84	1263	0	547	1695	0
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	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	624	0		206	0		208	2146		639	2784	
Arrive On Green	0.18	0.00	0.00	0.06	0.00	0.00	0.06	0.42	0.00	0.19	0.55	0.00
Sat Flow, veh/h	3456	516		3456	137		3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	516	53.2		137	62.4		84	1263	0	547	1695	0
Grp Sat Flow(s),veh/h/ln	1728	D		1728	E		1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	18.1			4.9			3.0	24.0	0.0	19.3	28.5	0.0
Cycle Q Clear(g_c), s	18.1			4.9			3.0	24.0	0.0	19.3	28.5	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	624			206			208	2146		639	2784	
V/C Ratio(X)	0.83			0.66			0.40	0.59		0.86	0.61	
Avail Cap(c_a), veh/h	2152			2152			271	2552		1193	3913	
HCM Platoon Ratio	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	0.00
Uniform Delay (d), s/veh	49.8			58.0			57.1	28.1	0.0	49.7	19.5	0.0
Incr Delay (d2), s/veh	3.5			4.4			1.5	0.4	0.0	3.4	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
%ile BackOfQ(50%),veh/ln	8.1			2.3			1.3	9.8	0.0	8.6	11.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2			62.4			58.6	28.6	0.0	53.1	19.9	0.0
LnGrp LOS	D			E			E	C		D	B	
Approach Vol, veh/h								1347	A		2242	A
Approach Delay, s/veh								30.5			28.0	
Approach LOS								C			C	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	31.8	63.0	16.0		16.1	78.7	31.2
Change Period (Y+Rc), s	8.5	10.0	8.5		8.5	10.0	8.5
Max Green Setting (Gmax), s	43.5	63.0	78.5		9.9	96.6	78.5
Max Q Clear Time (g_c+I1), s	21.3	26.0	6.9		5.0	30.5	20.1
Green Ext Time (p_c), s	2.0	19.0	0.6		0.1	38.2	2.6

Intersection Summary	
HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	720	0	350	50	0	60	460	1080	60	100	680	570
Future Volume (veh/h)	720	0	350	50	0	60	460	1080	60	100	680	570
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	800	0	0	56	0	0	511	1200	0	111	756	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	0	2	2	0	2	2	2	2	2	2	2
Cap, veh/h	853	0		853	0		527	2231		138	1114	
Arrive On Green	0.25	0.00	0.00	0.25	0.00	0.00	0.59	0.87	0.00	0.08	0.22	0.00
Sat Flow, veh/h	3456	800		3456	56		1781	5106	1585	1781	5106	1585
Grp Volume(v), veh/h	800	57.9		56	31.7		511	1200	0	111	756	0
Grp Sat Flow(s),veh/h/ln	1728	E		1728	C		1781	1702	1585	1781	1702	1585
Q Serve(g_s), s	25.0			1.4			30.2	6.2	0.0	6.7	14.9	0.0
Cycle Q Clear(g_c), s	25.0			1.4			30.2	6.2	0.0	6.7	14.9	0.0
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	853			853			527	2231		138	1114	
V/C Ratio(X)	0.94			0.07			0.97	0.54		0.81	0.68	
Avail Cap(c_a), veh/h	864			864			559	2231		217	1114	
HCM Platoon Ratio	1.00			1.00			2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			0.77	0.77	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	40.6			31.7			22.0	4.3	0.0	49.9	39.5	0.0
Incr Delay (d2), s/veh	17.3			0.0			25.1	0.7	0.0	5.2	3.3	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5			0.6			11.7	1.5	0.0	3.2	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.9			31.7			47.1	5.0	0.0	55.2	42.8	0.0
LnGrp LOS	E			C			D	A		E	D	
Approach Vol, veh/h								1711	A		867	A
Approach Delay, s/veh								17.6			44.4	
Approach LOS								B			D	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	41.1	33.3	35.6		17.0	57.4	35.6
Change Period (Y+Rc), s	8.5	9.3	8.5		8.5	9.3	8.5
Max Green Setting (Gmax), s	34.5	21.7	27.5		13.4	42.8	27.5
Max Q Clear Time (g_c+I1), s	32.2	16.9	3.4		8.7	8.2	27.0
Green Ext Time (p_c), s	0.4	2.6	0.1		0.0	15.2	0.2

Intersection Summary	
HCM 6th Ctrl Delay	34.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	230	1400	1010	470
Future Volume (veh/h)	0	0	230	1400	1010	470
Initial Q (Qb), veh			0	0	0	0
Ped-Bike Adj(A_pbT)			1.00			1.00
Parking Bus, Adj			1.00	1.00	1.00	1.00
Work Zone On Approach				No	No	
Adj Sat Flow, veh/h/ln			1870	1870	1870	1870
Adj Flow Rate, veh/h			250	1522	1098	511
Peak Hour Factor			0.92	0.92	0.92	0.92
Percent Heavy Veh, %			2	2	2	2
Cap, veh/h			353	3216	2575	1148
Arrive On Green			0.20	1.00	0.72	0.72
Sat Flow, veh/h			3456	3647	3647	1585
Grp Volume(v), veh/h			250	1522	1098	511
Grp Sat Flow(s),veh/h/ln			1728	1777	1777	1585
Q Serve(g_s), s			4.0	0.0	7.4	7.9
Cycle Q Clear(g_c), s			4.0	0.0	7.4	7.9
Prop In Lane			1.00			1.00
Lane Grp Cap(c), veh/h			353	3216	2575	1148
V/C Ratio(X)			0.71	0.47	0.43	0.44
Avail Cap(c_a), veh/h			651	3216	2575	1148
HCM Platoon Ratio			2.00	2.00	1.00	1.00
Upstream Filter(I)			0.73	0.73	0.83	0.83
Uniform Delay (d), s/veh			23.0	0.0	3.3	3.4
Incr Delay (d2), s/veh			0.7	0.4	0.4	1.0
Initial Q Delay(d3),s/veh			0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln			1.5	0.2	1.5	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh			23.8	0.4	3.7	4.4
LnGrp LOS			C	A	A	A
Approach Vol, veh/h				1772	1609	
Approach Delay, s/veh				3.7	3.9	
Approach LOS				A	A	

Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		60.0			10.8	49.2
Change Period (Y+Rc), s		5.7			* 4.7	5.7
Max Green Setting (Gmax), s		54.3			* 11	38.3
Max Q Clear Time (g_c+I1), s		2.0			6.0	9.9
Green Ext Time (p_c), s		5.7			0.2	18.1

Intersection Summary	
HCM 6th Ctrl Delay	3.8
HCM 6th LOS	A

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	390	190	0	1380	1070	0
Future Volume (veh/h)	390	190	0	1380	1070	0
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	0	1870	1870	0
Adj Flow Rate, veh/h	406	198	0	1438	1115	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	0	2	2	0
Cap, veh/h	563	258	0	2371	2371	0
Arrive On Green	0.16	0.16	0.00	0.67	1.00	0.00
Sat Flow, veh/h	3456	1585	0	3741	3741	0
Grp Volume(v), veh/h	406	198	0	1438	1115	0
Grp Sat Flow(s),veh/h/ln	1728	1585	0	1777	1777	0
Q Serve(g_s), s	6.7	7.2	0.0	13.6	0.0	0.0
Cycle Q Clear(g_c), s	6.7	7.2	0.0	13.6	0.0	0.0
Prop In Lane	1.00	1.00	0.00			0.00
Lane Grp Cap(c), veh/h	563	258	0	2371	2371	0
V/C Ratio(X)	0.72	0.77	0.00	0.61	0.47	0.00
Avail Cap(c_a), veh/h	778	357	0	2371	2371	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	2.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	0.19	0.89	0.00
Uniform Delay (d), s/veh	23.8	24.0	0.0	5.6	0.0	0.0
Incr Delay (d2), s/veh	1.0	4.0	0.0	0.2	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.8	0.0	3.3	0.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	24.8	28.0	0.0	5.8	0.6	0.0
LnGrp LOS	C	C	A	A	A	A
Approach Vol, veh/h	604			1438	1115	
Approach Delay, s/veh	25.9			5.8	0.6	
Approach LOS	C			A	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		45.7		14.3		45.7
Change Period (Y+Rc), s		5.7		4.5		5.7
Max Green Setting (Gmax), s		36.3		13.5		36.3
Max Q Clear Time (g_c+I1), s		15.6		9.2		2.0
Green Ext Time (p_c), s		14.9		0.6		15.5

Intersection Summary	
HCM 6th Ctrl Delay	7.8
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	360	0	780	0	3160	0	0	1290	1090
Future Volume (veh/h)	0	0	0	360	0	780	0	3160	0	0	1290	1090
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
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1870	0	1870	0	1870	0	0	1870	1870
Adj Flow Rate, veh/h				379	0	821	0	3326	0	0	1358	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				2	0	2	0	2	0	0	2	2
Cap, veh/h				1090	0	880	0	3808	0	0	2214	
Arrive On Green				0.32	0.00	0.32	0.00	0.59	0.00	0.00	0.59	0.00
Sat Flow, veh/h				3456	0	2790	0	6958	0	0	3741	3170
Grp Volume(v), veh/h				379	0	821	0	3326	0	0	1358	0
Grp Sat Flow(s),veh/h/ln				1728	0	1395	0	1609	0	0	1870	1585
Q Serve(g_s), s				10.5	0.0	35.4	0.0	54.2	0.0	0.0	28.9	0.0
Cycle Q Clear(g_c), s				10.5	0.0	35.4	0.0	54.2	0.0	0.0	28.9	0.0
Prop In Lane				1.00		1.00	0.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				1090	0	880	0	3808	0	0	2214	
V/C Ratio(X)				0.35	0.00	0.93	0.00	0.87	0.00	0.00	0.61	
Avail Cap(c_a), veh/h				1153	0	931	0	3817	0	0	2219	
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	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				32.6	0.0	41.2	0.0	21.4	0.0	0.0	16.2	0.0
Incr Delay (d2), s/veh				0.1	0.0	15.2	0.0	2.5	0.0	0.0	0.6	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				4.4	0.0	13.9	0.0	19.9	0.0	0.0	12.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				32.8	0.0	56.4	0.0	23.9	0.0	0.0	16.8	0.0
LnGrp LOS				C	A	E	A	C	A	A	B	
Approach Vol, veh/h					1200			3326			1358	A
Approach Delay, s/veh					48.9			23.9			16.8	
Approach LOS					D			C			B	

Timer - Assigned Phs	2		6		8							
Phs Duration (G+Y+Rc), s	79.3		79.3		44.7							
Change Period (Y+Rc), s	5.9		5.9		5.6							
Max Green Setting (Gmax), s	73.6		73.6		41.4							
Max Q Clear Time (g_c+I1), s	56.2		30.9		37.4							
Green Ext Time (p_c), s	17.2		18.9		1.7							

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

36: Lake Forest Dr. & I-5 SB Ramps/Avenida De La Carlota

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1990	470	610	170	0	460	0	2500	170	350	870	620
Future Volume (veh/h)	1990	470	610	170	0	460	0	2500	170	350	870	620
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	0	1870	0	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2073	490	635	177	0	479	0	2604	177	365	862	0
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	2	2	2	0	2	0	2	2	2	2	2
Cap, veh/h	2287	660	984	0	0	0	0	2862	606	474	1923	
Arrive On Green	0.35	0.35	0.35	0.00	0.00	0.00	0.00	0.38	0.38	0.09	0.51	0.00
Sat Flow, veh/h	6484	1870	2790		0		0	7481	1585	5344	3741	3170
Grp Volume(v), veh/h	2073	490	635		0.0		0	2604	177	365	862	0
Grp Sat Flow(s),veh/h/ln	1621	1870	1395				0	1870	1585	1781	1870	1585
Q Serve(g_s), s	29.9	22.6	18.7				0.0	32.4	7.6	6.6	14.3	0.0
Cycle Q Clear(g_c), s	29.9	22.6	18.7				0.0	32.4	7.6	6.6	14.3	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2287	660	984				0	2862	606	474	1923	
V/C Ratio(X)	0.91	0.74	0.65				0.00	0.91	0.29	0.77	0.45	
Avail Cap(c_a), veh/h	2388	689	1028				0	2870	608	587	2006	
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	1.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	27.9	26.7				0.0	28.7	21.1	43.8	15.1	0.0
Incr Delay (d2), s/veh	5.2	3.6	1.0				0.0	4.8	0.3	3.7	0.2	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	12.1	10.5	6.2				0.0	14.9	2.8	3.0	5.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	31.5	27.6				0.0	33.6	21.3	47.5	15.2	0.0
LnGrp LOS	D	C	C				A	C	C	D	B	
Approach Vol, veh/h		3198						2781			1227	A
Approach Delay, s/veh		33.3						32.8			24.8	
Approach LOS		C						C			C	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.9	43.9		41.5		56.8
Change Period (Y+Rc), s	* 4.2	6.3		6.8		6.3
Max Green Setting (Gmax), s	* 11	37.7		36.2		52.7
Max Q Clear Time (g_c+I1), s	8.6	34.4		31.9		16.3
Green Ext Time (p_c), s	0.2	3.2		2.8		7.3

Intersection Summary	
HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	960	340	20	480	610	80	100	110	1240	430	30
Future Volume (veh/h)	220	960	340	20	480	610	80	100	110	1240	430	30
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	229	1000	354	21	500	635	83	104	115	1292	448	31
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	278	1577	841	28	1346	1071	301	163	163	1492	514	36
Arrive On Green	0.08	0.44	0.44	0.02	0.38	0.38	0.09	0.09	0.09	0.30	0.30	0.30
Sat Flow, veh/h	3456	3554	1585	1781	3554	1585	3456	1870	1585	5023	1729	120
Grp Volume(v), veh/h	229	1000	354	21	500	635	83	104	115	1292	0	479
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1585	1728	1870	1585	1674	0	1849
Q Serve(g_s), s	9.8	32.7	20.2	1.8	15.3	32.5	3.4	8.1	10.5	36.5	0.0	36.9
Cycle Q Clear(g_c), s	9.8	32.7	20.2	1.8	15.3	32.5	3.4	8.1	10.5	36.5	0.0	36.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	278	1577	841	28	1346	1071	301	163	163	1492	0	549
V/C Ratio(X)	0.82	0.63	0.42	0.76	0.37	0.59	0.28	0.64	0.71	0.87	0.00	0.87
Avail Cap(c_a), veh/h	495	1577	841	49	1346	1071	532	288	269	2244	0	826
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	0.36	0.36	0.36	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	67.9	32.3	21.3	73.6	33.7	13.2	64.0	66.2	65.1	49.9	0.0	50.0
Incr Delay (d2), s/veh	2.3	2.0	1.5	5.6	0.3	0.9	0.2	1.6	2.1	1.7	0.0	4.7
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	4.4	14.6	9.6	0.9	6.7	24.7	1.5	3.9	4.4	15.5	0.0	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.2	34.3	22.8	79.1	34.0	14.0	64.2	67.7	67.2	51.6	0.0	54.7
LnGrp LOS	E	C	C	E	C	B	E	E	E	D	A	D
Approach Vol, veh/h		1583			1156			302			1771	
Approach Delay, s/veh		36.9			23.8			66.6			52.4	
Approach LOS		D			C			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.6	62.8		19.1	6.8	72.5		51.6				
Change Period (Y+Rc), s	4.5	6.0		6.0	4.5	6.0		7.0				
Max Green Setting (Gmax), s	21.5	14.9		23.1	4.1	32.3		67.0				
Max Q Clear Time (g_c+I1), s	11.8	34.5		12.5	3.8	34.7		38.9				
Green Ext Time (p_c), s	0.3	0.0		0.5	0.0	0.0		5.7				

Intersection Summary	
HCM 6th Ctrl Delay	41.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	130	10	280	500	70	810	100	2860	900	0	2400	110
Future Volume (veh/h)	130	10	280	500	70	810	100	2860	900	0	2400	110
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		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	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	134	10	289	399	0	1008	103	3177	775	0	2474	113
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	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	131	137	226	420	0	1122	124	4319	915	1	3570	163
Arrive On Green	0.07	0.07	0.07	0.24	0.00	0.24	0.07	0.58	0.58	0.00	0.63	0.63
Sat Flow, veh/h	1781	1870	1585	1781	0	4755	1781	7481	1585	1781	7525	344
Grp Volume(v), veh/h	134	10	289	399	0	1008	103	3177	775	0	1992	595
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1585	1781	1870	1585	1781	1515	1809
Q Serve(g_s), s	11.0	0.7	11.0	33.1	0.0	30.8	8.6	46.8	60.7	0.0	32.3	32.3
Cycle Q Clear(g_c), s	11.0	0.7	11.0	33.1	0.0	30.8	8.6	46.8	60.7	0.0	32.3	32.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	131	137	226	420	0	1122	124	4319	915	1	2875	858
V/C Ratio(X)	1.03	0.07	1.28	0.95	0.00	0.90	0.83	0.74	0.85	0.00	0.69	0.69
Avail Cap(c_a), veh/h	131	137	226	475	0	1268	178	4319	915	59	2875	858
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.00	0.67	0.67
Uniform Delay (d), s/veh	69.5	64.7	64.3	56.4	0.0	55.6	68.9	23.3	26.2	0.0	20.5	20.5
Incr Delay (d2), s/veh	85.8	0.1	154.0	26.3	0.0	7.6	1.4	0.1	1.0	0.0	0.9	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	8.1	0.4	18.4	17.9	0.0	13.1	4.0	20.4	22.6	0.0	10.4	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	155.3	64.8	218.2	82.7	0.0	63.1	70.3	23.4	27.2	0.0	21.4	23.6
LnGrp LOS	F	E	F	F	A	E	E	C	C	A	C	C
Approach Vol, veh/h		433			1407			4055			2587	
Approach Delay, s/veh		195.2			68.7			25.3			21.9	
Approach LOS		F			E			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	0.0	92.6		16.0	15.4	77.2		41.4
Change Period (Y+Rc), s	5.0	6.0		5.0	5.0	6.0		6.0
Max Green Setting (Gmax), s	5.0	72.0		11.0	15.0	62.0		40.0
Max Q Clear Time (g_c+I1), s	0.0	62.7		13.0	10.6	34.3		35.1
Green Ext Time (p_c), s	0.0	5.8		0.0	0.0	5.3		0.3

Intersection Summary	
HCM 6th Ctrl Delay	40.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Appendix G

Background Report for Infrastructure Analysis

WEST YOST ASSOCIATES
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: June 27, 2018 Project No.: 487-12-18-15
SENT VIA: EMAIL

TO: Amanda Tropiano, De Novo Planning Group

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SUBJECT: Background Report for Infrastructure Analysis for the City of Lake Forest General Plan Update

This Technical Memorandum (TM) presents background information on the water, wastewater, and storm water systems in the City of Lake Forest (City) for the update of the City's General Plan. This update is being performed by De Novo Planning Group. The purpose of this document is to describe the existing conditions of the water, wastewater, and storm water infrastructure within the City; identify and summarize major infrastructure issues or upgrades; and present the past and anticipated future water demands and wastewater flows. This TM is organized into the following sections:

- General Overview
- Water Distribution System
- Sewer Collection System and Wastewater Treatment
- Storm Water and Flood Control

1.0 GENERAL OVERVIEW

The City of Lake Forest does not directly provide water service, wastewater collection, or wastewater treatment to its residents. Rather, three (3) separate, independent utility districts provide these services to residents within the City. The utility district boundaries can be seen overlaid with the City's boundary on Figure 1. The majority of residents are provided water, wastewater collection, and wastewater treatment by the Irvine Ranch Water District (IRWD), whose boundaries cover 8,300 acres in the City, or approximately 83 percent of the total area of the City. Residents along the southwest edge of the City are provided these utility services by El Toro Water District (ETWD). ETWD serves approximately 1,421 acres or 13 percent of the total area of the City. Finally, a small portion of residents in the northeastern section of the City are serviced by Trabuco Canyon Water District (TCWD). As detailed below, the most recent versions of the three utility districts' Master Plans were reviewed to evaluate how the water and wastewater

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utility services are provided within the City. IRWD's latest update to its Sewer Collection System Master Plan occurred in 2016, with its Water Resources Master Plan updated in 2017; ETWD's Water and Sewer Master Plan was most recently updated in 2004; and TCWD's latest Water, Wastewater and Reclaimed Water Master Plan was most recently updated in 1999. The most recent versions of ETWD and IRWD's Urban Water Management Plan (UWMP) and Sewer System Management Plan (SSMP) were also reviewed to more accurately determine projected water demands and supply and projected sewer flows and treatment capacity of each utility district.

Flood control facilities and maintenance are provided by the City of Lake Forest.

2.0 WATER DISTRIBUTION SYSTEM

Water distribution to the City of Lake Forest is described below. The water utility infrastructure that serves the City, broken down by utility district, can be found on Figure 2.

2.1 Water System Description by Utility District

The water systems and water services provided by each utility district are summarized below.

2.1.1 Irvine Ranch Water District

The majority of the City is provided water service by IRWD. Prior to 2001, water service was provided by Los Alisos Water District (LAWD). In 2001, IRWD annexed LAWD's service area inside the City's boundaries. IRWD is one of the largest water districts in Orange County, serving the entire City of Irvine and portions of Tustin, Santa Ana, Costa Mesa, Newport Beach, and Lake Forest; an area of approximately 132 square miles. IRWD is a member agency of the Municipal Water District of Orange County (MWDOC), which is a wholesale importer and member agency of the Metropolitan Water District (MWD). As such, MWDOC is entitled to receive water from the available sources of MWD. IRWD receives its imported water supplies through MWDOC.

A small portion of the City, the Portola Hills community, is located within the TCWD service area boundary, yet is provided water by IRWD. For this area, TCWD reads the meters and bills the residents, then IRWD bills TCWD for the total amount of water consumed by residents within the TCWD boundary.

2.1.1.1 Water Infrastructure

IRWD's potable water supply inside the borders of Lake Forest consists of almost 250 miles of potable water lines. Due to the major elevation changes within the district, IRWD uses 15 pressure zones to deliver water to customers within a reasonable pressure. Five (5) of these pressure zones fall within the borders of Lake Forest; Lake Forest Zones 4, 5, and 6, Foothill Ranch Zone, and Portola Hills Zone.

2.1.1.2 Potable Water Supply

According to the most recent IRWD Water Master Plan update, groundwater makes up about 53 percent of the total water supply, recycled water makes up 24 percent, imported (treated and untreated) makes up 20 percent, and native surface water makes up around 3 percent. In the FY 2014/2015, about 20 percent of IRWD's potable water needs were met through water purchased

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and supplied by MWD through MWDOC. The majority of IRWD's potable water is a blend of Colorado River water and State Water Project water that is treated at the MWD Diemer Filtration Plant (DFP) located north of Yorba Linda. Two (2) major transmission lines deliver water from the DFP to IRWD, the Allen McColloch Pipeline (AMP) and East Orange County Feeder No. 2 (EOCF#2). IRWD owns 64.7 cfs capacity in the AMP and 41.4 cfs capacity in the EOCF#2.

Groundwater currently makes up about 78 percent of the potable water supply in the district, and approximately 53 percent of all water supplies including non-potable. Water is pumped from the Orange County Groundwater Basin through seven (7) potable production wells. The Orange County Groundwater Basin is managed by Orange County Water District (OCWD) who has the authority to impose replenishment assessments and basin equity assessments on production. The primary mechanism used by OCWD to manage pumping from the basin is the Basin Production Percentage (BPP). The BPP is the percentage of each Producer's water supply that is allowed from groundwater pumped from the basin without incurring a financial penalty. The BPP is set on an annual basis and is uniform for all producers within the groundwater basin's watershed. Groundwater pumping above the BPP is assessed an additional charge that creates a disincentive for over-producing. Currently, and for the foreseeable future, the BPP will be limited to 75 percent. The 2014 IRWD Water Resources Master Plan Update states IRWD is looking to expand groundwater production in the future to max out their groundwater production to the max BPP of 75 percent.

2.1.1.3 Non-potable Water Supply

Non-potable water meets a large portion of the landscape irrigation demands within IRWD's service area. The non-potable supply consists primarily of recycled water that has been treated at IRWD's Michelson Water Recycling Plan (MWRP) and Los Alisos Water Recycling Plan (LAWRP). Untreated water supplements the recycled water supply through native runoff and the untreated imported water purchased and delivered to Irvine Lake.

Only the section of the City northeast of Trabuco Road and southwest of Highway 241 are currently served with non-potable water. The area of City south of Trabuco Road and the area north of Highway 241 are currently being provided a potable water supply for demands that could be served by non-potable water.

2.1.1.4 El Toro Water District

ETWD provides service to residents in the Southeast corner of the City. The district area is almost entirely built out with residential communities and serves the entire City of Laguna Woods as well as portions of Aliso Viejo, Laguna Hills, Laguna Woods, Lake Forest, and Mission Viejo. The Lake Forest and Mission Viejo sections of ETWD, which are the only sections east of the I-5 freeway, contain the highest elevations in the district and require pump stations to deliver water.

Like IRWD, ETWD is a member agency of the Municipal Water District of Orange County (MWDOC). ETWD receives all its imported water supply through MWDOC.

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2.1.1.5 Water Infrastructure

ETWD supplies water through approximately 50 miles of potable water lines within the City boundary. ETWD has a total of 13 pressure zones, however only four (4) of these zones serve the City: Shenandoah Zone, Cherry Zone, R-6 Zone, and Gravity Zone. The Shenandoah, Cherry, and R-6 Zones exclusively serve the City and are referred to by ETWD as the "Panhandle". These zones are the highest zones in elevation in the district and require pump stations to serve them directly. Gravity Zone is ETWD's largest pressure zone by area, serving parts of Lake Forest, Mission Viejo, Laguna Hills, Laguna Woods, and Aliso Viejo.

2.1.1.6 Potable Water Supply

ETWD relies completely on imported treated water from MWDOC to meet 100 percent of potable water demands. In general, imported water from MWDOC fills the District's 275 million gallon El Toro Reservoir (R-6), located just outside of ETWD in Mission Viejo, or directly feeds the distribution system. The majority of imported water is delivered to ETWD through the MWDOC owned Allen-McColloch Pipeline (AMP) where ETWD owns the right to 26.3cfs of capacity.

ETWD also owns 2.0 cfs (1.29 mgd) capacity in the Joint Regional Water Supply System (JRWSS), which transports MWD treated water as well. The JRWSS is a take-off from MWD's EOCF#2. The JRWSS is managed, operated and maintained by the South Coast Water District (SCWD). Both the AMP and EOCF#2 originate at MWD's DFP located in Yorba Linda.

ETWD has an emergency supply source available to them through the Aufdenkamp Connection Transmission Main (ATCM), which is owned and operated by the Santa Margarita Water District (SMWD). ETWD does not own any capacity in the ATCM but may receive permission from SMWD to take water from the pipeline in an emergency situation.

2.1.1.7 Non-Potable Water Supply

At the time the ETWD master plan was completed, the District was recycling approximately 10 percent of the wastewater treated at the ETWD Water Recycling Plant, which amounts to approximately 0.5 mgd. The recycled water is primarily used for irrigation of the Leisure World Golf Course, which is located in the City of Laguna Woods. None of the recycled water is used in the City of Lake Forest.

2.1.2 Trabuco Canyon Water District

A portion of the City of Lake Forest's Portola Hills community is the only area that lies within TCWD boundaries. However, under terms of an agreement with IRWD, IRWD supplies water to the 532 connections. TCWD reads the meters and bills the customers for water service then IRWD bills TCWD for the water supplied to these customers. The evaluation of water demands indicates these customers have an average demand of 0.24 mgd and a maximum day demand of 0.48 mgd.

2.2 Projected Potable Water Demands and Supply

For this section, the ETWD and IRWD 2015 UWMPs were reviewed to determine how the projected demand compared to the projected available supply for each utility district.

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2.2.1 Irvine Ranch Water District

The 2015 UWMP developed future water demand projections and future water supply projections for the entire utility district. These projections were used to analyze if IRWD had enough supply to meet the projected water demand. The projections can be found in Table 1. As shown, IRWD is projected to have significantly more supply than demand in 2035.

2.2.2 El Toro Water District

Since ETWD is mostly built out, increases in future water demand would be through redevelopment of existing land uses. The 2004 ETWD Master Plan identifies four (4) areas of possible development within the City of Lake Forest that will impact water demand. The Arbor/El Toro Road redevelopment project will increase the landscaped area resulting in an increased irrigation demand. An existing light industrial area along El Toro Road is proposed to be redeveloped with a rail station, commercial property and multi-family residential. An additional 244 units is proposed to be added to the Saddleback Ranch Apartment located on Los Alisos Boulevard. The City also anticipates redeveloping the mobile home parks, approximately 120 acres, into master planned communities in the future. It is estimated that these projects will increase the average day domestic water demand by 239 gpm, or 0.344 mgd, or 0.532 cfs.

The 2004 ETWD Master Plan states that the District's capacity in the AMP is equivalent to the maximum day demand, therefore the current supply is deemed adequate. Estimated future demands increase only slightly, therefore additional turnout capacity is not anticipated.

Projected potable water demand and supply values from the 2015 ETWD UMWP are presented in Table 1. Since ETWD relies completely on imported water from MWDOC, the available supply presented is equal to the demand.

2.2.3 Trabuco Canyon Water District

As stated in Section 2.1.2, customers within the Portola Hills community are served potable water by IRWD. The community has an average day demand of 0.24 mgd and a maximum day demand of 0.48 mgd. The community is already built out and no redevelopment has been planned. Therefore, future flows are expected to remain the same. These demand values are included in the projected demand for IRWD in Table 1.

Table 1. Projected Potable Water Demand vs. Supply, AF

Utility District	Projected 2035 Demand	Projected 2035 Supply
IRWD	81,996	111,277
ETWD	7,315	7,315

Note: Water demands generated by the Portola Hills Community are included in the IRWD demands. IRWD demands and supply based on 2015 IRWD UMWP. ETWD demands and supply based on 2015 ETWD UMWP.

2.3 Water System Issues and Opportunities

Issues with the infrastructure that arise from increase in the projected demand are summarized below.

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2.3.1 Irvine Ranch Water District

The latest IRWD potable and non-potable water system analysis was developed and run for the 1999 IRWD Master Plan. Most of the Lake Forest service area belonged to LAWD at the time and was not included in the analysis. The only parts of the City that were included in the potable system analysis were the Foothill Ranch community and the Portola Hills community, northeast of Freeway 241. No section of Lake Forest was included in the non-potable system analysis.

The potable water system analysis included using a hydraulic model to evaluate the system at average day, maximum day plus fire flow, and peak hour demand conditions for existing, intermediate and ultimate build-out. Deficiencies in the model located within Lake Forest for ultimate built out conditions are listed below.

- For maximum day plus fire flow demand, model results for the Portola Hills community reflect the zone's inability to provide fire flow demand to the fire node at the minimum residual pressure of 20 psi. The Master Plan recommended a parallel pipeline to remedy these inadequacies. It is unclear if the recommended improvements have been made.
- Under peak hour demand, approximately ten (10) pipes in the system operate at a velocity greater than 8 fps under peak conditions (8-11 fps). Around three (3) of these pipes are within the borders of Lake Forest, however, all ten (10) pipes operate at approximately 1 fps under average day demands. According to the Master Plan, "these minor violations of the established velocity criteria (8 fps) are not considered critical; no recommendations are made for improvements to this system."

IRWD relies on Sub-Area Master Plans (SAMPs) to determine infrastructure needs throughout its service area. A SAMP provides a focused evaluation of infrastructure requirements in a specific area of the IRWD service area, based upon the general evaluations performed for the master plan. It is likely that a SAMP would be developed in response to land use changes proposed by the City of Lake Forest General Plan Update.

2.3.2 El Toro Water District

For the 2004 ETWD Master Plan, a hydraulic model of the ETWD Water Distribution System was developed to identify any deficiencies in the system. The system was analyzed under the maximum day extended period simulation scenario for existing and anticipated future flows to identify deficiencies in the system like areas that exceed either the high or low-pressure criteria, areas that cannot provide fire flows, or pipes with velocities that exceed the criteria.

The only deficiencies identified by the model within the Lake Forest city boundary involved several areas in the R-6 Zone that could not provide adequate fire flows of 1,500 gpm at 20 psi. These areas are located near the intersection of Brookhaven and Alderwood or on Fallbrook (just across Trabuco). However, the model was used to verify that in an emergency situation, the nearby pressure reducing valve PR-20, which provides back-up supply from the Cherry Zone to the R-6 Zone, will open to assist in meeting fire flow demands.

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2.3.3 Trabuco Canyon Water District

As discussed in Section 2.1.3, IRWD provides water to residents in the Lake Forest Portola Hills community who are within the TCWD boundaries. Hydraulic analysis of the Portola Hills community was included in the IRWD hydraulic Analysis. There are no discrepancies in the Portola Hills community.

3.0 SEWER COLLECTION SYSTEM AND WASTEWATER TREATMENT

Sewer collection and wastewater treatment for the City of Lake Forest are described below.

3.1 Wastewater System Description by Utility District

As with the water system, the City's sewer services are divided up by three (3) utility districts, Irvine Ranch Water District, El Toro Water District, and Trabuco Canyon Water District. Among the three (3) agencies, there are approximately 215 miles of sewer main within the borders of Lake Forest. The wastewater infrastructure that serves the City is laid out in Figure 3.

3.1.1 Irvine Ranch Water District

IRWD wastewater collection and treatment facilities are discussed below.

3.1.1.1 Sewer Collection System Infrastructure

IRWD provides wastewater collection and wastewater treatment to the majority of residents in the City. IRWD maintains approximately 175 miles of sewer mains within the City of Lake Forest. Flow originating within Lake Forest northeast of Highway 241 flows across the IRWD collection system to the MWRP. All other flow originating in Lake Forest is directed to the LAWRP. Recycled water is produced at both plants, and recycled water makes up about 20 percent of IRWD's current water supply.

The 2014 IRWD Master Plan Update identifies five (5) sewer sheds for the City of Lake Forest including Alton-Bake, Bake, El Toro; Muirlands Cherry, Lake Forest, and Portola. The Alton-Bake shed, located northeast of Highway 241 flows to MWRP, while the Bake, El Toro; Muirlands Cherry, and Lake Forest sheds flow to LAWRP. The Portola shed flows into the sewer system owned by TCWD.

3.1.1.2 Wastewater Treatment Capacity

The MWRP is located on Riparian Way south of Michelson Drive, on the northwest side of the San Diego Creek in the City of Irvine. As of 2008, the MWRP had a plant capacity of 18 mgd but it was recently expanded to a capacity of 28 mgd.

The LAWRP is located on the corner of Muirlands Boulevard and Aspen Street in the City of Lake Forest. As of 2014, the LAWRP had a plant capacity of 7.5 mgd but only approximately 3.43 mgd was being conveyed to the LAWRP for treatment.

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3.1.2 El Toro Water District

ETWD wastewater collection and treatment facilities are discussed below.

3.1.2.1 Sewer Collection System Infrastructure

The southeast portion of the City is served by El Toro Water District. ETWD's most recent Water and Sewer Master Plan was published in 2004. ETWD maintains approximately 34 miles of sewer mains within the City of Lake Forest. The majority of the flow in the City's ETWD area is conveyed by gravity and eventually flows across the I-5 highway via an 18-inch trunk main southwest into Laguna Woods where the ETWD Water Recycling Plant (WRP) is located.

Flow originating from the community located just south of Ralph A. Gates Elementary School flows across the I-5 highway and into Laguna Woods south of the 18-inch trunk main. The flow then is directed to the Aliso Viejo Pump Station where it is pumped to the ETWD WRP. Wastewater from a few small residential streets at the far south end of the City flows southeast into Mission Viejo to Freeway Lift Station where it joins flow from Mission Viejo and is pumped to the ETWD collection system west of the I-5 highway.

3.1.2.2 Wastewater Treatment Capacity

The current ETWD WRP has an average flow capacity of 5.4 mgd but has the ability to accommodate up to 6 mgd during max month conditions. The ETWD WRP recycles about 10 percent of the water it treats.

3.1.3 Trabuco Canyon Water District

TCWD wastewater collection and treatment facilities are discussed below.

3.1.3.1 Sewer Collection System Infrastructure

Residents who live in part of the Portola Hills community in the northeast section of the City are serviced by Trabuco Canyon Water District. TCWD's most recent Master Plan was created in 1999. TCWD's collection system consists of three (3) zones that are served by gravity sewers and lift stations; Robinson Ranch Zone, Dove Canyon Zone, and El Toro Road Zone. The Portola Hills community falls within the El Toro Road Zone and consists of approximately 8 miles of sewer mains. Flow from this community is directed into the El Toro Road Sewage Collection System, which is jointly-owned by TCWD, IRWD, and Santa Margarita Water District (SMWD). All flow from the El Toro Road Sewage Collection System is pumped into SMWD's wastewater collection system and is eventually treated at the Chiquita Water Reclamation Plant then disposed of.

3.1.3.2 Wastewater Treatment Capacity

As discussed above, the only section of Lake Forest which TCWD provides wastewater services for is a portion of the Portola Hills community. The amount of flow capacity available to the Portola Hills Community is limited by the total capacity that TCWD owns in SMWD's wastewater collection system and the Chiquita Water Reclamation Plant. The District owns 0.558 mgd of capacity in SMWD's wastewater collection system and Chiquita Water Reclamation Plant. 0.428

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mgd is reserved specifically for TCWD's El Toro Road Zone. Of the 0.428 mgd reserved for the El Toro Road Zone, 0.158 mgd is reserved for its Portola Hills customers.

3.2 Projected Wastewater Flows

Projected wastewater flows for the three districts serving the City are discussed below.

3.2.1 Irvine Ranch Water District

To analyze the existing system, wastewater generation factors were developed from data acquired during flow monitoring conducted in 2015 as part of the IRWD Sewer Collection System Master Plan Update. Sewer flow monitoring data, SCADA data at sewage lift stations and the treatment plants, non-irrigation water billing data, and land use information were all collectively utilized in developing these wastewater generation factors.

The projected future wastewater flows for each wastewater treatment facility are presented in Table 2 along with the treatment capacity discussed above. It should be noted that IRWD is currently performing a treatment master plan to evaluate alternatives for supplying adequate treatment capacity for its service area in the future.

3.2.2 El Toro Water District

The ETWD 2004 Master Plan identified yearly average flow through the WRP for years 2001-2003 based on monthly influent flow data. The results show a slight decrease in average influent flow for this period. Average daily flow was 5.29 mgd in 2001, 4.82 mgd in 2002, and 4.94 mgd in 2003. The Master Plan does not break down the existing flow for wastewater generated inside the City of Lake Forest, however it does break down increased projected flow specifically for the City of Lake Forest.

The ETWD 2004 Master Plan identified four (4) possible areas of redevelopment within the borders of Lake Forest that will impact wastewater generation. The Arbor/El Toro Road redevelopment project is a landscape project and will not generate any additional sewage. An existing light industrial area along El Toro Road is proposed to be redeveloped with a rail station, commercial property and multi-family residential. An additional 244 units are proposed to be added to the Saddleback Ranch Apartments located on Los Alisos Boulevard. The City also anticipates redeveloping the mobile home parks, approximately 120 aces, into master planned communities in the future. It is estimated that these projects will increase the average daily wastewater generation by 146.6 gpm, or 0.211 mgd.

The projected wastewater flows that are directed to the ETWD WRP are presented in Table 2 along with the treatment capacity.

3.2.3 Trabuco Canyon Water District

The 1999 TCWD Master Plan does not specifically identify any possible development inside the borders of Lake Forest. It is assumed the projected flows for the Portola Hills Community will stay below 0.158 mgd. The Portola Hills community is not included in Table 2.

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Due to the age of the Master Plan provided by TCWD, it is worth noting that capacity agreements between TCWD and SMWD for the SMWD wastewater collection system and the Chiquita Water Reclamation Plant may have changed.

Table 2. Projected Sewer Flow vs. Treatment Capacity, mgd

Utility District	Projected Build-out Flow	Current Total Treatment Capacity
IRWD MWRP	32.6	28.0
IRWD LAWRP	5.0	7.5
ETWD WRP	6.9	6.0

3.3 Sewer Collection System and Wastewater Treatment Issues and Opportunities

Collection system and treatment issues and opportunities are discussed below

3.3.1 Irvine Ranch Water District

For the Existing System Analysis completed as part of the IRWD Master Plan, a model of the system was constructed in 1999 using Innovyze's InfoSWMM. This model was updated in 2014. The hydraulic analysis indicates that the trunk main in the Alton Parkway, which conveys flows from portions of the City, has future potential capacity deficiencies.

IRWD relies on Sub-Area Master Plans (SAMPs) to determine infrastructure needs throughout its service area. A SAMP provides a focused evaluation of infrastructure requirements in a specific area of the IRWD service area, based upon the general evaluations performed for the master plan. It is likely that a SAMP would be developed in response to land use changes proposed by the City of Lake Forest General Plan Update.

3.3.2 El Toro Water District

As of the 2004 El Toro Water District Master Plan, there were no deficient pipes in the existing collection system according to the model. The 2004 El Toro Water District Master Plan identified possible development in four (4) areas within their system inside the borders of Lake Forest. The projects were estimated to increase average daily wastewater generation created by the City of Lake Forest by 146 gpm. The model was run again with the projected increased wastewater generation values from the four (4) possible development areas along with a 20 percent increase due to inflow and infiltration (I&I). The results were analyzed for the WRP and the existing sewer mains and are summarized by West Yost below.

The ETWD WRP was analyzed to determine if it had sufficient capacity to accommodate the projected development. The WRP was completely reconstructed in 1998 to accommodate the increased demands from heavy commercial and residential development during the 1990's and now has a capacity under an average flow condition of 5.4 mgd. The WRP also has the ability to accommodate maximum month flows up to 6 mgd. After a capacity analysis was completed, it was found that the WRP capacity was adequate to treat flows after construction of all proposed developments within the entire ETWD identified in the Master Plan.

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Pipelines were analyzed to determine if there would be any deficiencies as wastewater flow increased due to the proposed developments. After the model was run under the future loading condition with I&I, a total of 56 pipes exceeded the criteria for d/D (flow depth/pipe diameter) of 75 percent, with 40 of those pipes having a d/D value of 100 percent (indicating surcharging). Many of the deficient pipes identified are within the City of Lake Forests borders.

3.3.3 Trabuco Canyon Water District

There are currently no deficient pipes in the Portola Hills community, the only community in the City that is being serviced by TCWD. As stated above, the amount of flow capacity is limited by the total capacity that TCWD owns in SMWD's wastewater collection system and the Chiquita Water Reclamation Plant. However, due to its small area of influence inside the City of Lake Forest, TCWD is not expected to have any significant issues in terms of capacity in the City and development in the future will not be an issue.

4.0 STORMWATER AND FLOOD CONTROL

The storm water management and flood control systems are described below.

4.1 General Description and Summary of the Storm Drain System

The City's stormwater control systems are currently owned and operated by the City of Lake Forest. Until recently, the Orange County Flood Control District owned and operated the stormwater control system within the City. The City took over control of all facilities recently and is currently in the process of tracking, mapping, and analyzing the facilities.

4.2 Description of Infrastructure

As stated above, control of the stormwater facilities was recently assumed by the City of Lake Forest. At this time, the City does not have its own mapping of the stormwater facilities; however, the Orange County Flood Control District has extensive mapping of all storm facilities available on their website. The Drainage Facilities Basemap Index and the maps specific to Lake Forest that describe the existing stormwater structures are included in Appendix A of this report. These maps have dates ranging from 2000 to 2007.

4.3 Floodplain Mapping

Figure 4 illustrates the local watersheds along with the 100-year flood zones. The flood zone data used is the National Flood Hazard Layer (NFHL) downloaded on the June 25, 2018 from the Federal Emergency Management Agency (FEMA) Flood Map Service Center for Orange County. The most recent Letter of Map Revision (LOMR) effective date is March 20, 2017 and the latest study effective date is December 3, 2009.

4.4 Stormwater and Flood Control Issues

As stated above the City is currently evaluated the stormwater facilities. After evaluation, the City will determine any deficiencies within the system.

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5.0 REFERENCES

Irvine Ranch Water District, 2017. *Water Resources Master Plan*. Prepared in 1999, updated in 2017. Received March 15, 2018.

Irvine Ranch Water District, 2016. *Sewer Collection System Master Plan*. Prepared in 2006, updated in 2016. Received March 15, 2018.

Irvine Ranch Water District, 2015. *Urban Water Management Plan*. Prepared in 2015. Received as appendix to Master Plan March 15, 2018.

Irvine Ranch Water District, 2013. *Sewer System Management Plan*. Prepared in 2013. Received March 15, 2018.

Irvine Ranch Water District. Water and Wastewater Geographical Information System files received from Irvine Ranch Water District. Water Files Received 2018, Wastewater files received 2016.

El Toro Water District, 2004. *Water and Sewer Master Plan*. Prepared in 2004, received March 2018.

El Toro Water District. Geographical Information System files received from El Toro Water District. Received March 5, 2018.

Trabuco Canyon Water District, 1999. *Water Wastewater and Reclaimed Water Master Plan*. Prepared in 1999. Received February 5, 2018.

Trabuco Canyon Water District, 2017. Geographical Information System files received from Trabuco Canyon Water District. Received March 9, 2018.

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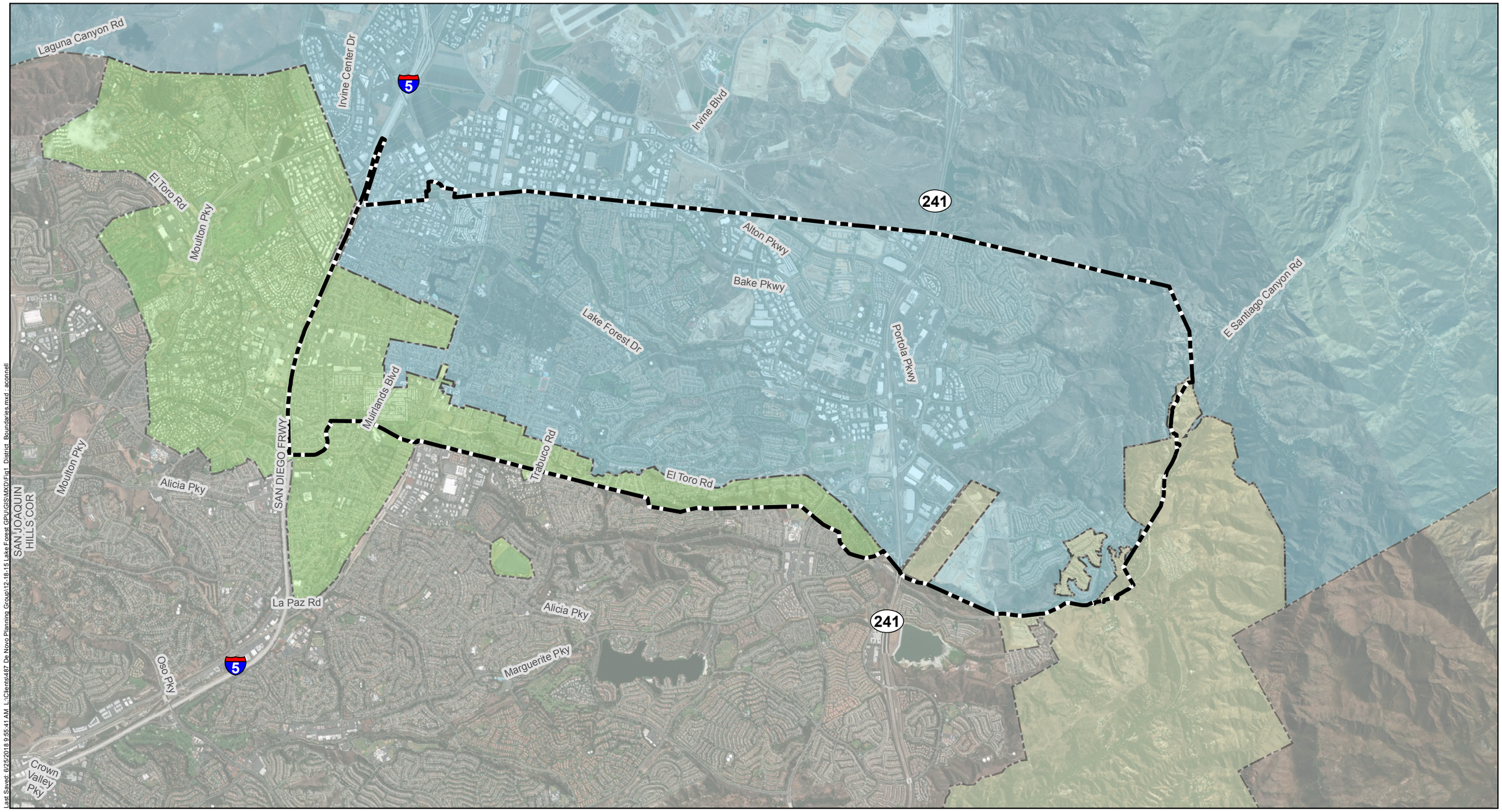

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Symbology

- Lake Forest City Boundary
- Trabuco Canyon WD Boundary
- El Toro Water District Boundary
- Irvine Ranch WD Boundary

N

0 2,000 4,000

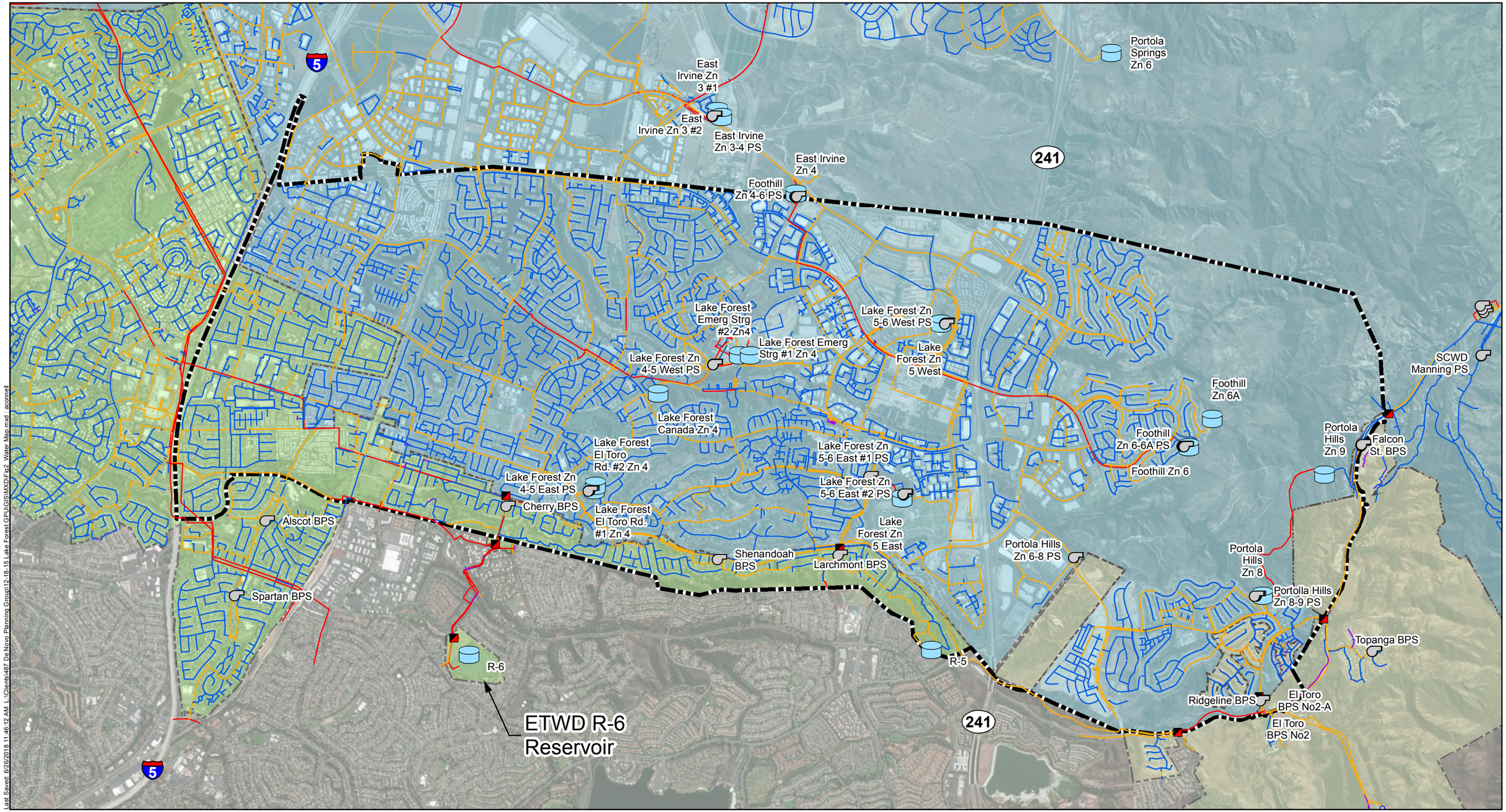
Scale in Feet

WEST YOST ASSOCIATES

Figure 1

City of Lake Forest Utility District Boundaries

City of Lake Forest
General Plan Update



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Symbology

- Pump Station
- Interconnection
- Reservoir

Water Main Diameter

- No Diameter Data
- 2-8 in
- 10-20 in
- 21+ in

- LAKE FOREST
- El Toro Water District Boundary
- Irvine Ranch WD Boundary
- Trabuco Canyon WD Boundary

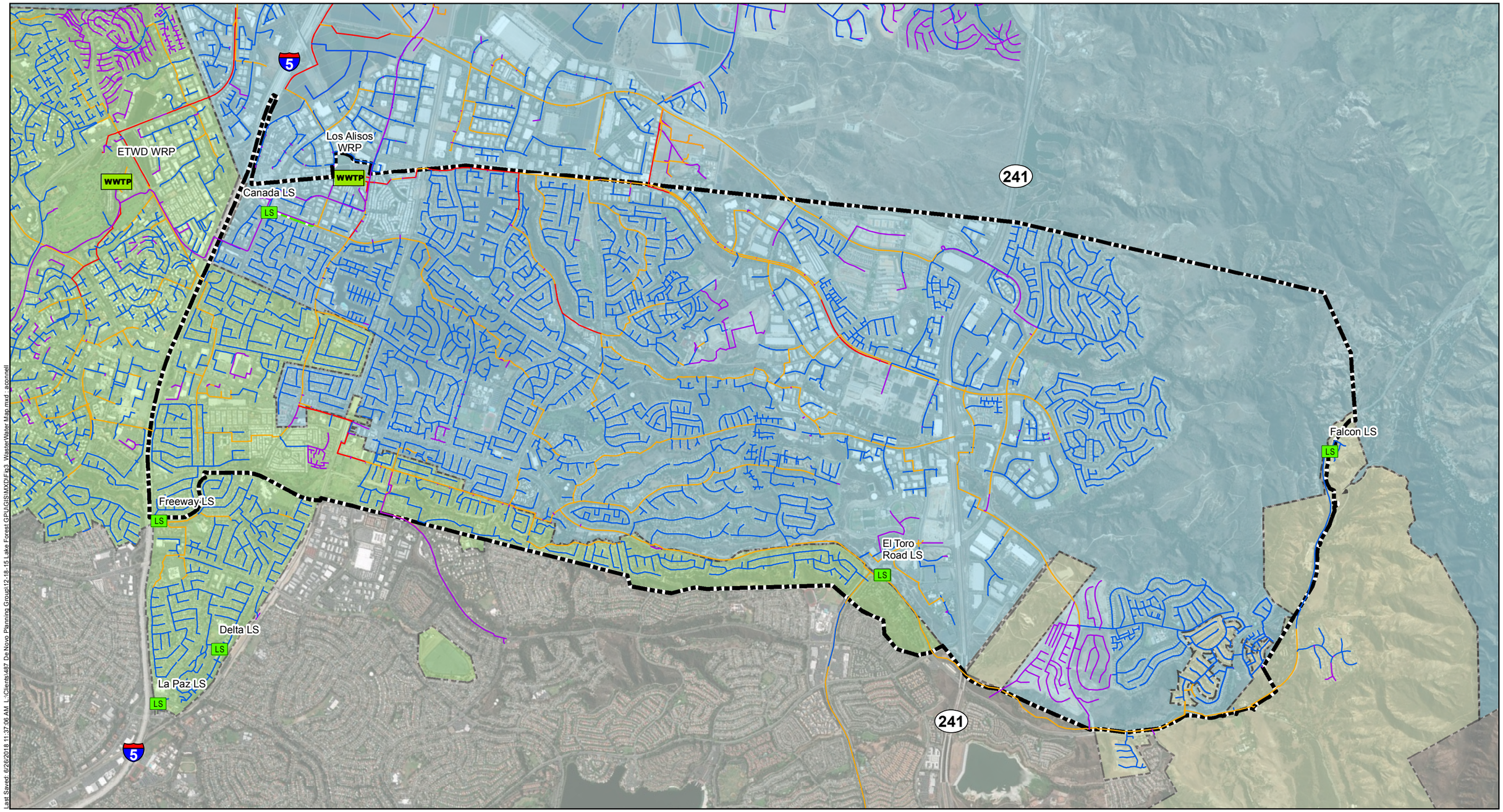
0 1,500 3,000
Scale in Feet

WEST YOST ASSOCIATES

Figure 2

City of Lake Forest Water Mains

City of Lake Forest General Plan Update



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Symbology

- LS — Sewer Lift Station
- WWTP — Wasterwater Treatment Plant

Sewer Main Diameter

- No Diameter Data
- 2-8 in
- 10-18 in
- 20+ in

- LAKE FOREST
- El Toro Water District Boundary
- Irvine Ranch WD Boundary
- Trabuco Canyon WD Boundary

N

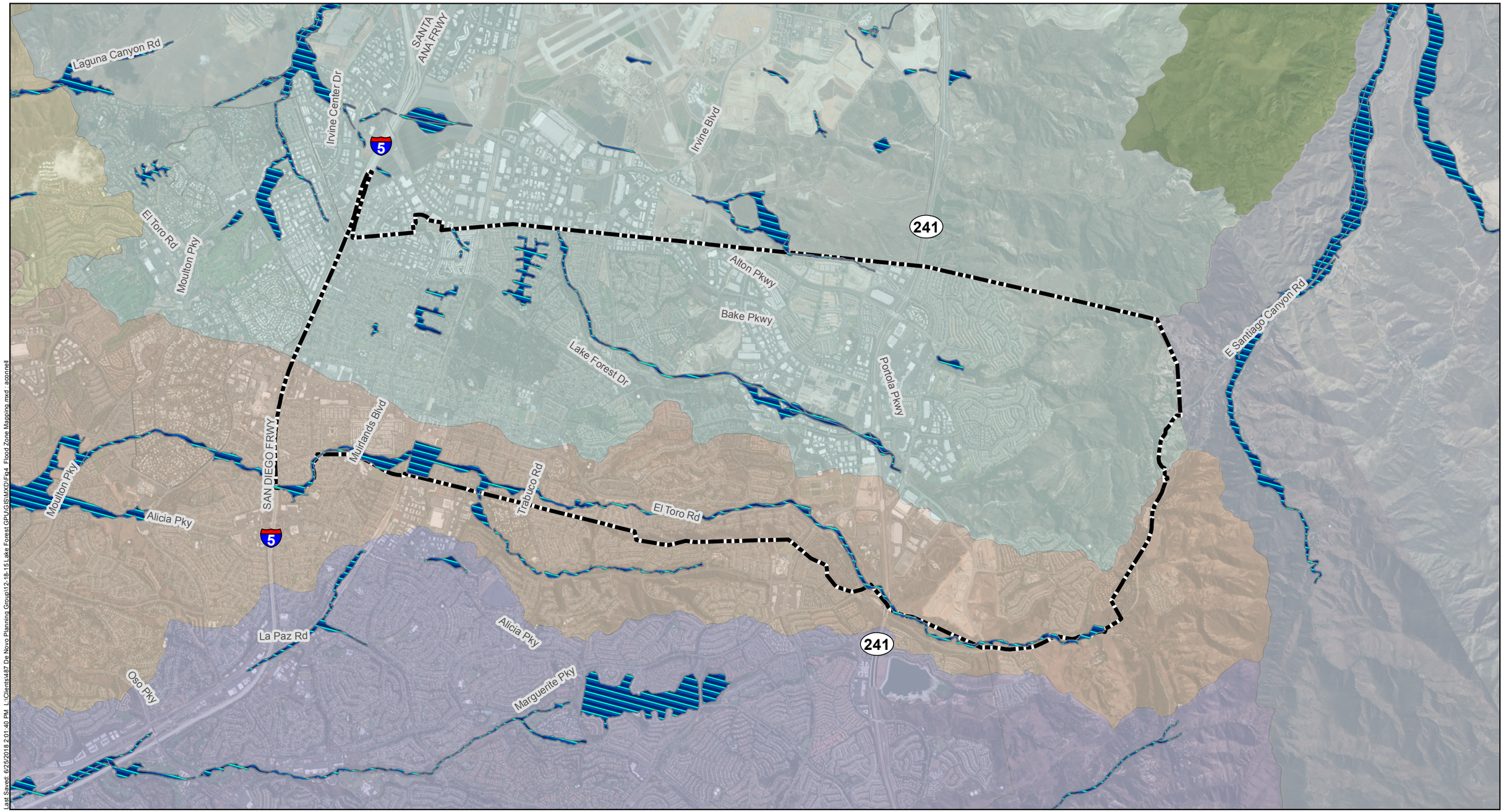
0 1,500 3,000
Scale in Feet

WEST YOST ASSOCIATES

Figure 3

City of Lake Forest Wastewater Sewer Mains

City of Lake Forest
General Plan Update



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Symbology

- 100 Year Flood Zone
- City of Lake Forest Boundary

Watersheds

- Upper San Diego Creek
- Aliso Creek
- Arroyo Trabuco
- Salt Creek-Frontal Gulf of Santa Catalina
- Lower Santiago Creek
- Upper Santiago Creek

0 2,000 4,000
Scale in Feet

WEST YOST ASSOCIATES

Figure 4

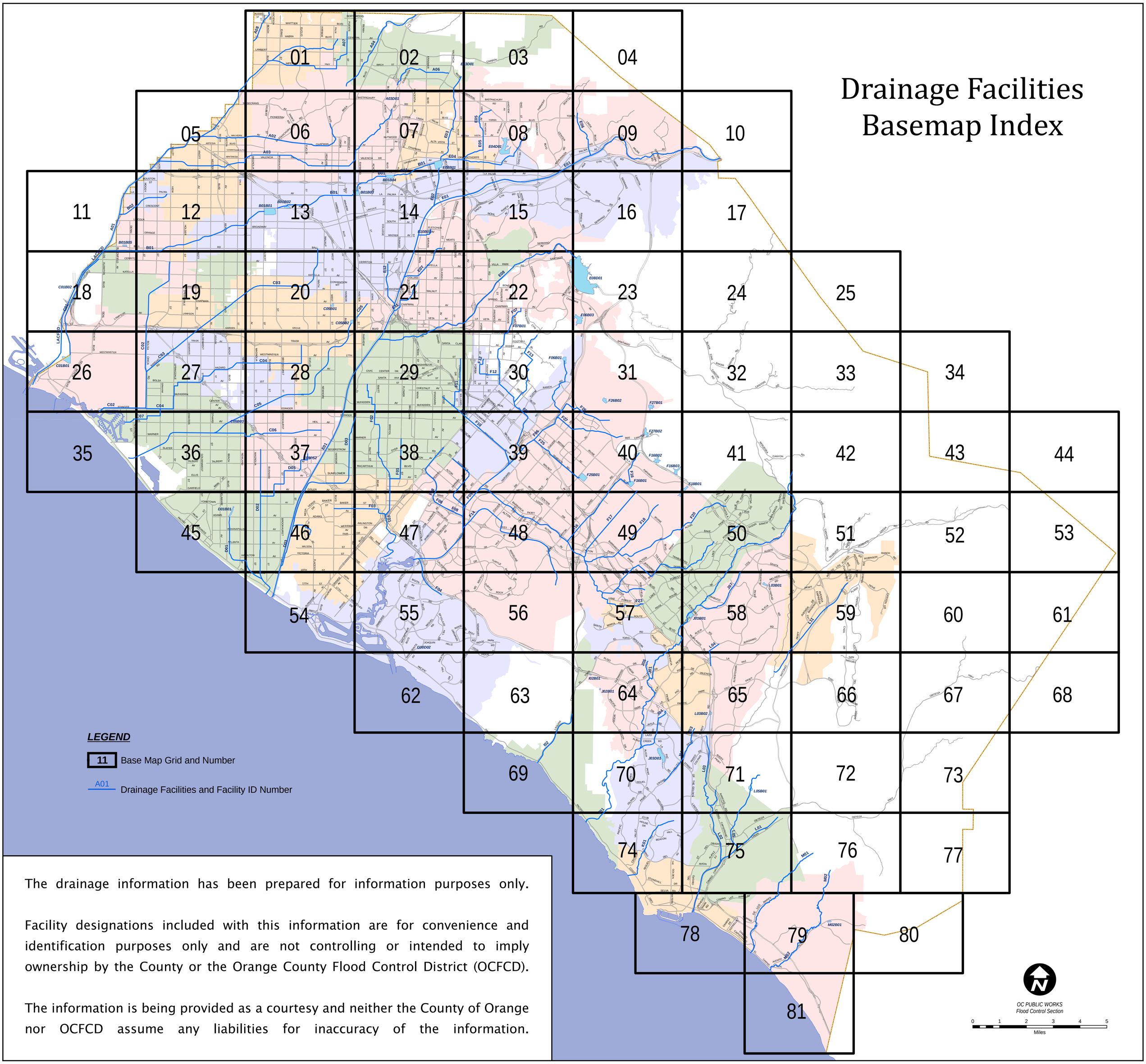
City of Lake Forest Flood Zone Mapping

City of Lake Forest
General Plan Update

APPENDIX A

Existing Stormwater Infrastructure

Drainage Facilities Basemap Index



The drainage information has been prepared for information purposes only.

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E 622407.690
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41

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Scale: 1"=600'

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Call: Alan Vu at (714) 834-5986 to notify Public Facility and Resources Department (PFRD) of additions or corrections.

50

ORANGE COUNTY FLOOD CONTROL DISTRICT			
BASEMAP OF DRAINAGE FACILITIES IN ORANGE COUNTY			
REVISION	DATE	SHEET NO.	DWG. NO.
AVU	JAN.12/2000	41	MAPS-113-3

- Channel Drainage Area Boundary
- Major Sub-Area Drainage Boundary
- Minor Sub-Area Drainage Boundary
- Existing O.C.F.C.D. Facility
- Existing Local Facility
- Existing Retarding Basin or Reservoir
- Natural Watercourse
- City Limits
- C — Greenbelt
- P.S. — Pump Station
- Catch Basin (length in feet)
- Drop Inlet or Other Entry
- Ownership (if other than city or county)
- P — Private
- S — State
- F — Federal

Existing O.C.F.C.D.	Existing LOCAL	
		Earth Trapezoidal Channel (base width by height in feet)
		Reinforced Concrete Trapezoidal Channel (base width by height in feet)
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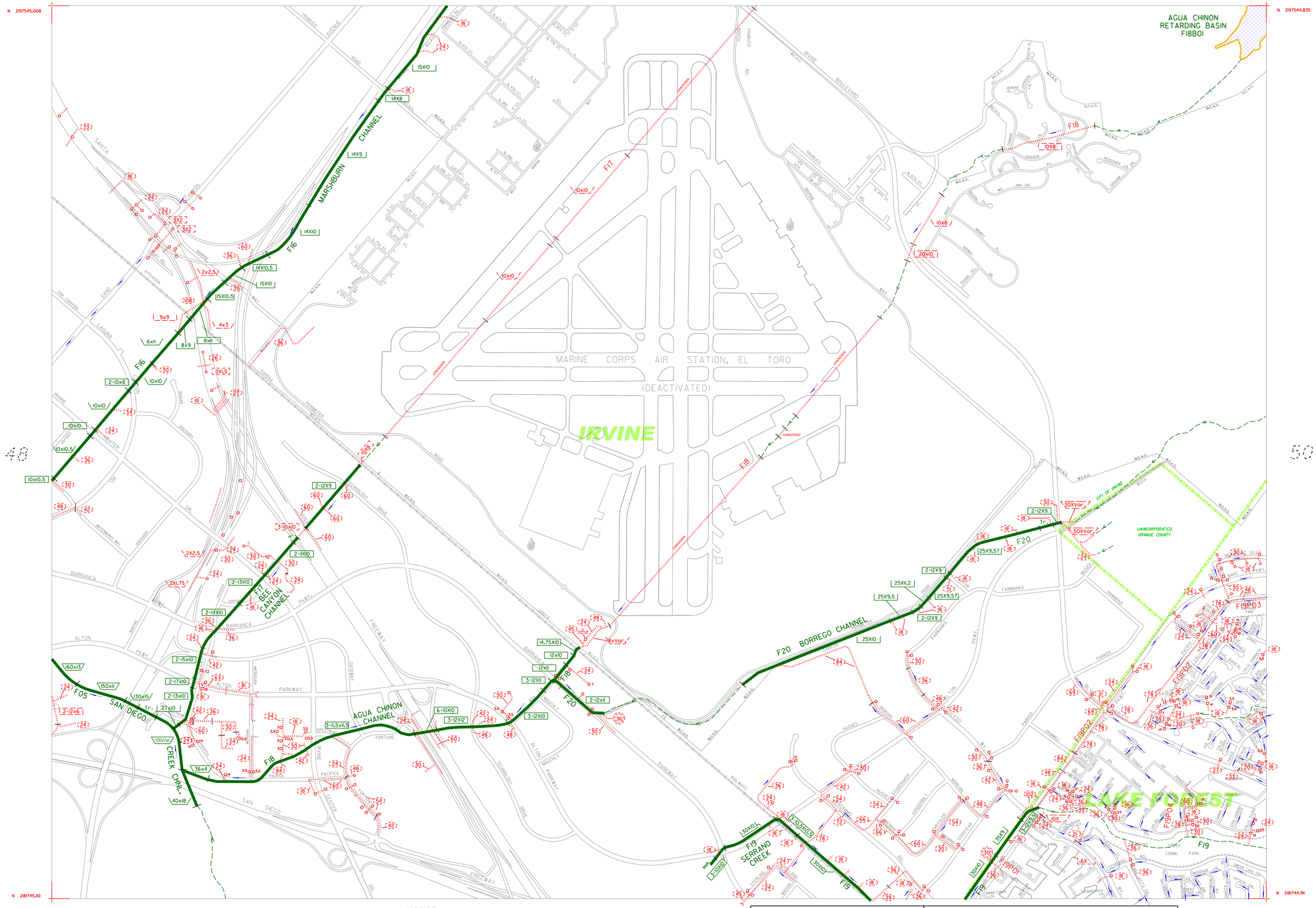
		Reinforced Concrete Arch (base span by height in inches)
		Corrugated Metal Arch (base span by height in inches)

41



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ORANGE COUNTY FLOOD CONTROL DISTRICT

BASE MAP OF DRAINAGE FACILITIES IN ORANGE COUNTY

REVISION	DATE	SHEET NO.	DWG. NO.
S. GUTIERREZ	OCT 1,2008	49	MAPS-113-3

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Ownership (If other than City or County): Private = P State = S Federal = F

EXISTING FACILITIES

O.C.F.C.D.	LOCAL	
		Earth Trapezoidal Channel (base width by height in feet)
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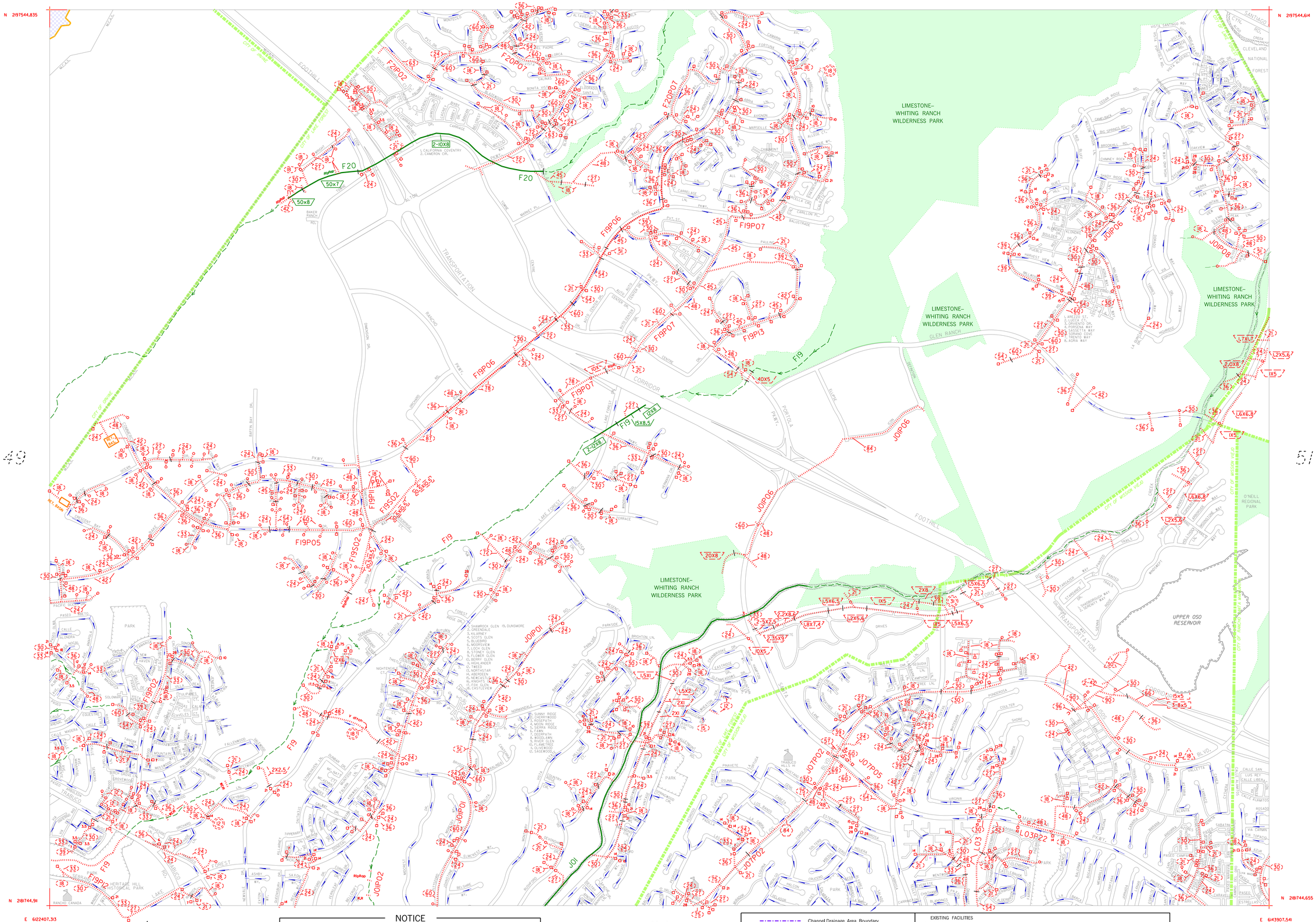

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ORANGE COUNTY FLOOD CONTROL DISTRICT

BASE MAP OF DRAINAGE FACILITIES IN ORANGE COUNTY

REVISION	DATE	SHEET NO.	DWG. NO.
S. GUTIERREZ	MAR 12/2008	50	MAPS-113-3

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Scale: 1"=600'

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ORANGE COUNTY FLOOD CONTROL DISTRICT			
BASEMAP OF DRAINAGE FACILITIES IN ORANGE COUNTY			
REVISION	DATE	SHEET NO.	DWG. NO.
AVU	JAN.12/2000	51	MAPS-113-3

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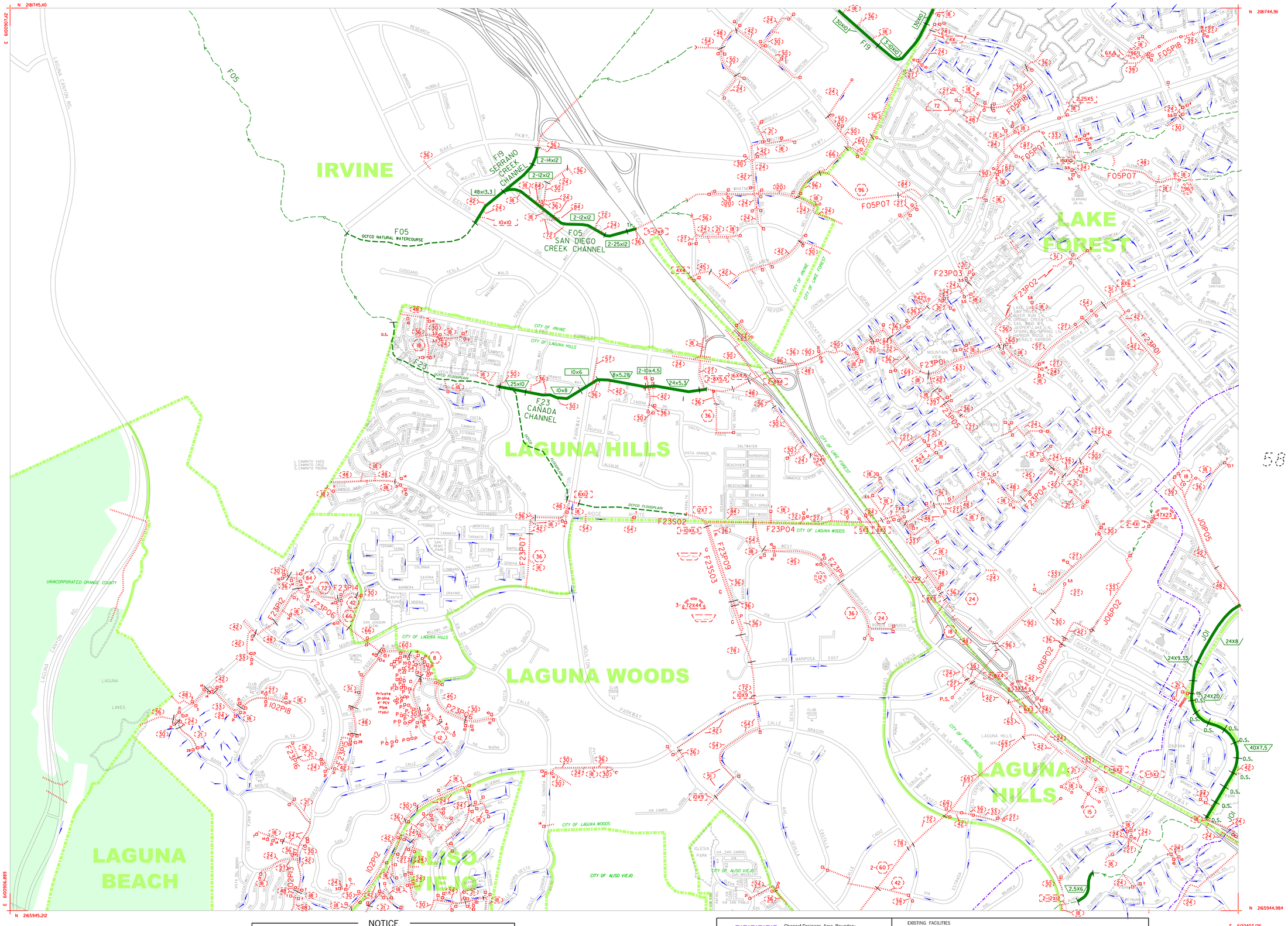

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FEET

64

ORANGE COUNTY FLOOD CONTROL DISTRICT

BASE MAP
OF DRAINAGE FACILITIES
IN ORANGE COUNTY

REVISION	DATE	SHEET NO.	DWG. NO.
S. GUTIERREZ	OCT 1,2008	57	MAPS-113-3

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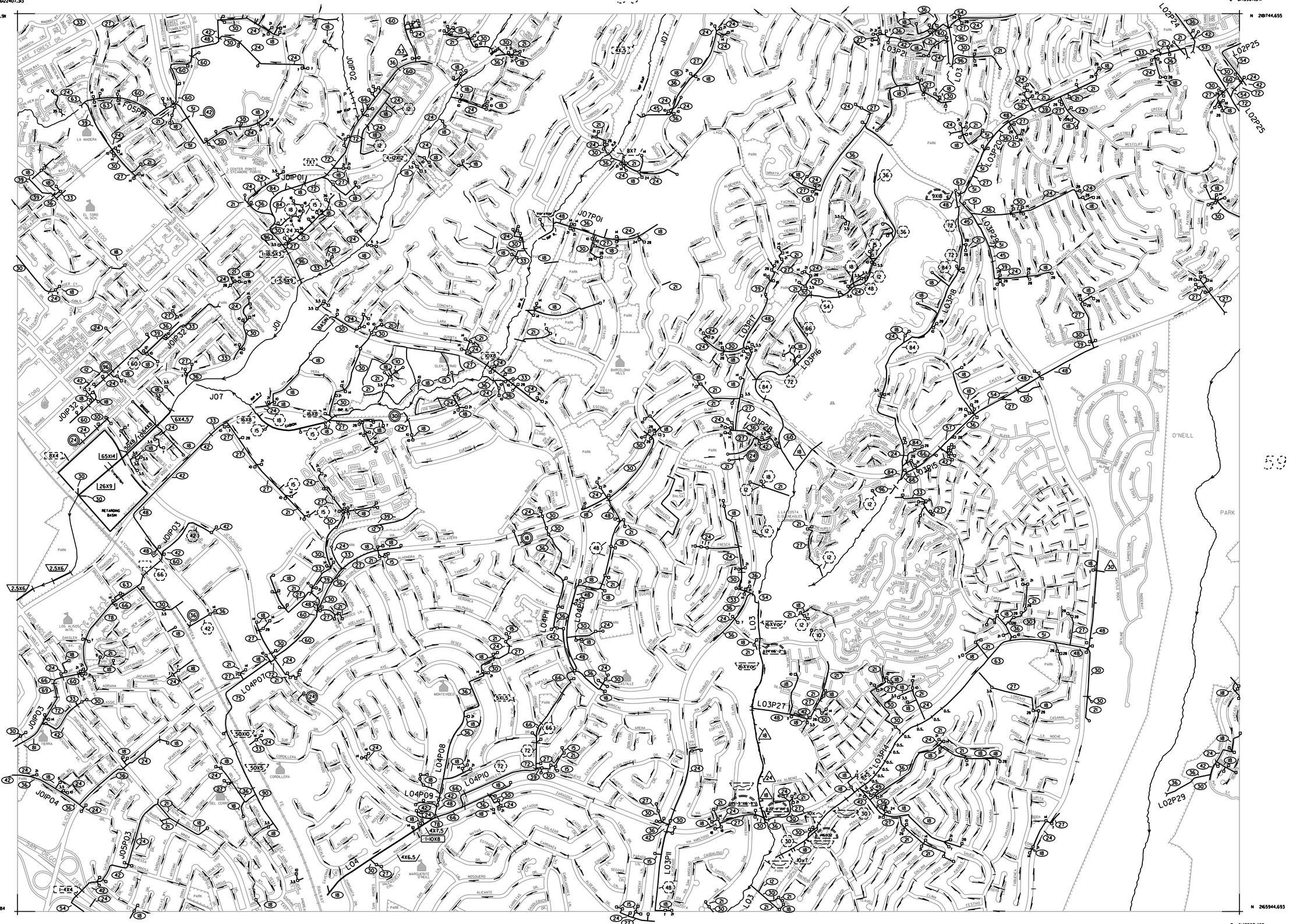

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ORANGE COUNTY FLOOD CONTROL DISTRICT			
BASEMAP OF DRAINAGE FACILITIES IN ORANGE COUNTY			
REVISION	DATE	SHEET NO.	DWG. NO.
AVU	JAN.12/2000	58	MAPS-113-3

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	Major Sub-Area Drainage Boundary		
	Minor Sub-Area Drainage Boundary		
	Existing O.C.F.C.D. Facility		
	Existing Local Facility		
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	City Limits		
G	Greenbelt		
P.S.	Pump Station		
▫	Catch Basin (length in feet)		
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58

PORTOLA CENTER AREA PLAN

CHAPTER FIVE

INFRASTRUCTURE, COMMUNITY FACILITIES, & SERVICES

5.1 SUMMARY OF PROJECT FACILITIES & SERVICES

5.2 WATER DISTRIBUTION SYSTEM

5.3 WASTEWATER SYSTEM

5.4 STORM WATER DETENTION, TREATMENT AND DRAINAGE SYSTEM

5.5 ELECTRIC, GAS, AND COMMUNICATION SERVICES

5.6 POLICE, FIRE, AND EMERGENCY MEDICAL SERVICES

5.7 SCHOOLS

5.1 SUMMARY OF PROJECT FACILITIES AND SERVICES

This Chapter describes the water, waste water, storm water facilities, electric, gas, and communications facilities, police and fire services, and school services necessary to support for the Project.

As part of this Area Plan, the Portola Center Project includes a Public Facilities Financing & Phasing Plan that describes the major public and backbone improvements in the Project, outlines the financing options for construction and maintenance of the Project's major facilities and improvements, and lays out the major phases of grading and development. Further discussion of the timing of these facilities and services can be found in the PFFP Plan.

5.2 WATER DISTRIBUTION SYSTEM

Domestic water service and reclaimed water service are provided by the Irvine Ranch Water District (IRWD). Portola Center is within the Glenn Ranch Road Sub-area Master Plan for water facilities and Water Improvement District No. 188 which will be utilized to provide service to the new development. Existing 10", 12" and 16" water mains are located in Glenn Ranch Road and 10" and 16" water mains exist in Saddleback Ranch Road. These existing water mains will be utilized to provide domestic water service to the project's internal water distribution system. The Project's existing and proposed water distribution system is shown in Exhibit 5-1: Portola Center Water Distribution System below.

Reclaimed water facilities are not currently available to the Project site. The Project will include reclaimed water backbone infrastructure to HOA-maintained landscape areas and parks facilities such that those areas can be irrigated with reclaimed water should services become available to the Project site in the future.

5.3 WASTEWATER SYSTEM

Sewage collection and treatment is provided by the Irvine Ranch Water District and the Santa Margarita Water District. The plan area is within the Glenn Ranch Sub-area Master Plan for sewer facilities and Sewer Improvement District No. 288 which will be utilized to provide service to the new development. A new 12-inch sewer line between Portola Parkway and Saddleback Ranch Road will provide service to the existing Portola Hills Community as well as the majority of the Portola Center Project. Approximately 125 homes within the southeastern portions of the Portola South Planning Area will sewer out to El Toro Road. The Project's existing and proposed wastewater system is shown in Exhibit 5-2: Portola Center Wastewater System below. This system will provide a gravity connection to the El Toro Trunk Sewer exiting out the southwest corner of the site and a gravity connection to the new 12-inch sewer line in Glenn Ranch Road exiting out the western corner of the site.

5.4 STORM WATER DETENTION, TREATMENT, AND DRAINAGE SYSTEM

The Project falls inside the edge of the San Diego Regional Water Quality Control Board (RWQCB) Basin Plan and, therefore, the Project must meet the applicable hydromodification and water quality treatment requirements of the San Diego RWQCB (reference specific regulations). The Project also must meet the Orange County Flood Control requirements to avoid downstream flooding impacts on existing properties or facilities. To meet these requirements, the Project incorporates a combination of hydromodification detention facilities, water quality treatment facilities, and flood control facilities. Where possible, the Project has optimized the design of these facilities by combining hydromodification and flood control functions and incorporating pre- and post-detention treatment facilities into the hydromodification and flood control facilities.

The Project will construct and maintain its own storm water facilities, including storm drain inlets and catch basins, underground storm drains, underground storm water detention and treatment facilities, and storm drain outfalls. The Project's storm drain system is depicted in Exhibit 5-3 below. Existing runoff from Portola Hills will flow into the underground detention chamber prior to controlled discharge into the natural drainage system offsite. All of the Portola Center Project's detention and treatment facilities are located in the Portola South Planning Area, and the Project's facilities are sized to accommodate storm water runoff from the Portola Northwest and Northeast Planning Areas as well as runoff from the South.

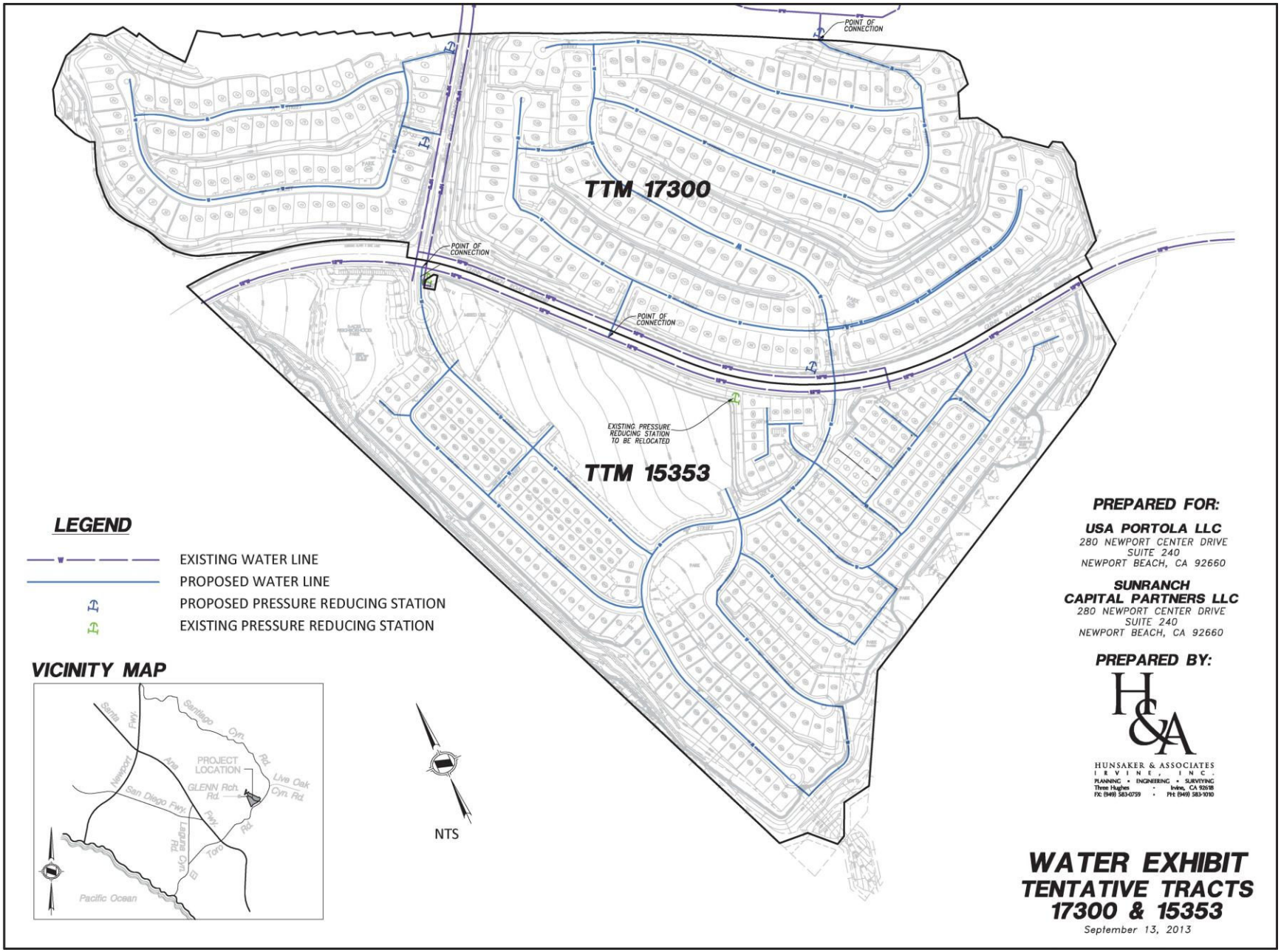

Exhibit 5-1
Portola Center Water Distribution System

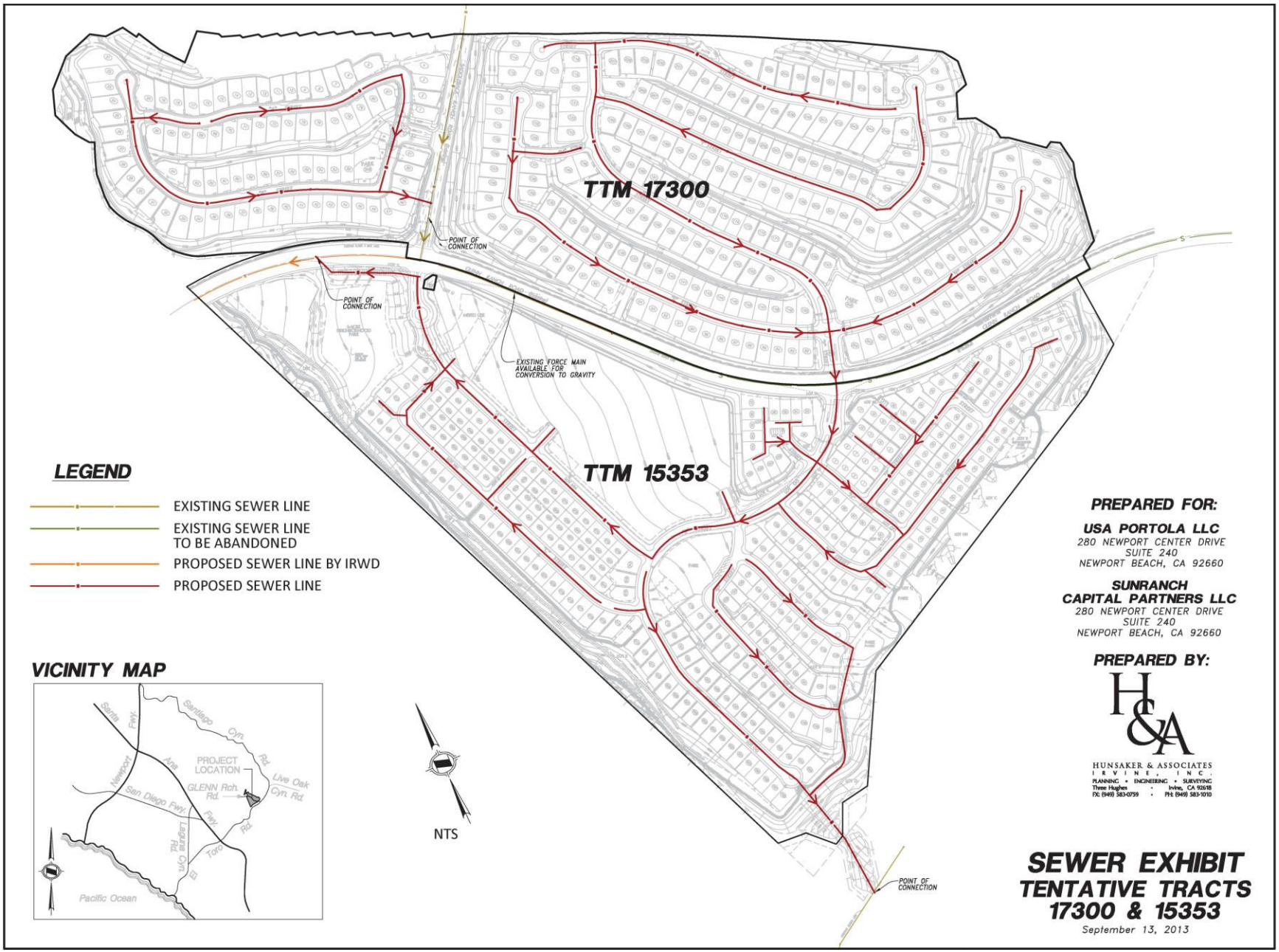

Exhibit 5-2
Portola Center Wastewater System

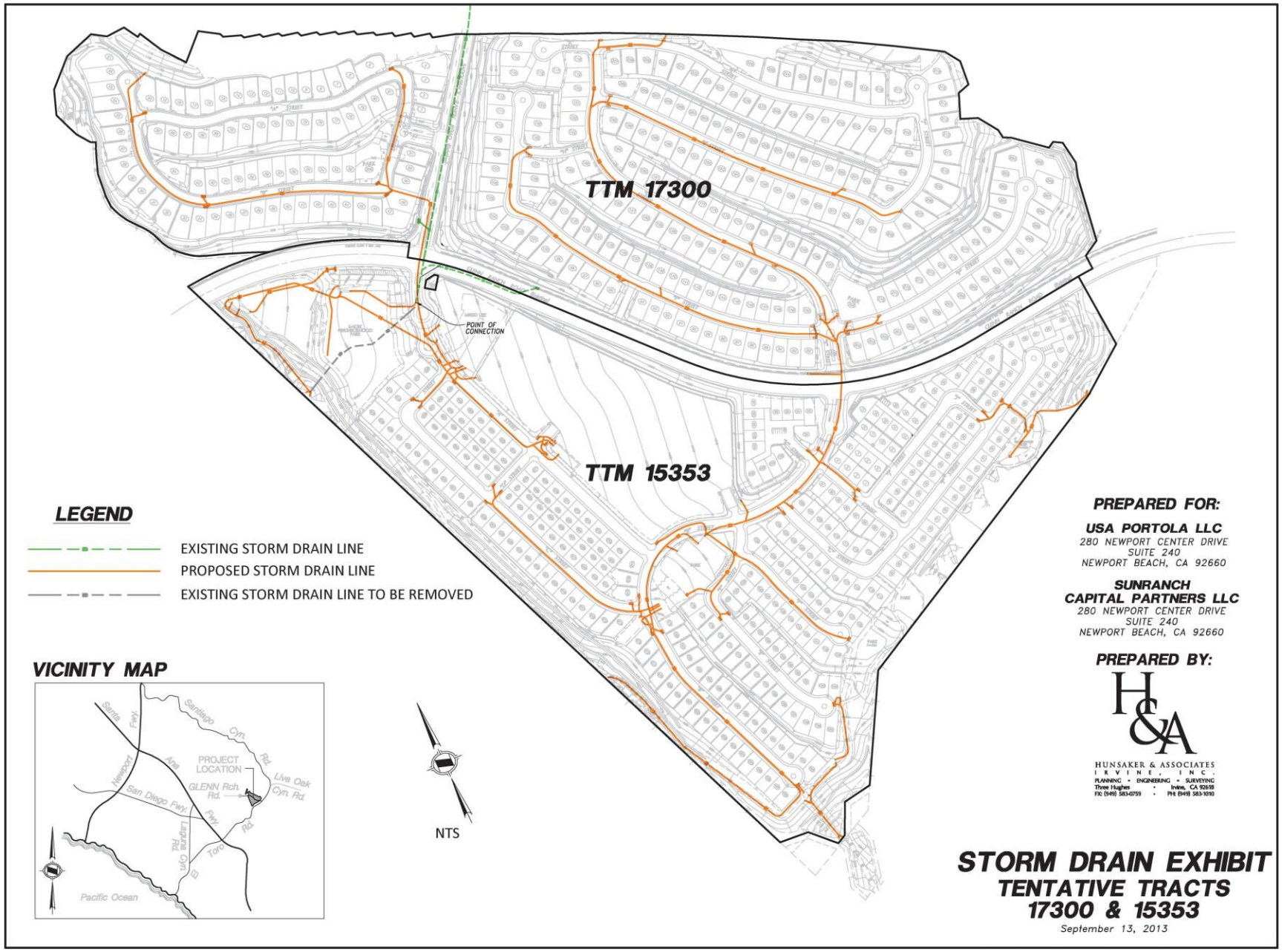

Exhibit 5-3
Portola Center Storm Drain System

5.5 ELECTRIC, GAS, AND COMMUNICATION SERVICES

The Project's dry utilities include electrical and natural gas services, and communication services (telephone, cable and internet). Southern California Edison (SCE) and Southern California Gas Company provide electric and gas services, respectively, to the Project and the surrounding area. Electrical transmission service to the Project area is provided via a transmission line extending along Santiago Canyon Road and natural gas transmission service is provided via a 6-inch main within El Toro Road. Electric and gas distribution services are extended through Glenn Ranch Road and Saddleback Ranch Road to which the Project will connect. The developer will be responsible for constructing connections to these distribution facilities and the backbone distribution systems for the Project.

Telephone, Cable, and Internet services also exist in Glenn Ranch Road and Saddleback Ranch Road and these services will be extended into the Project at the Project's four entrances. Internal to the Project, the Project Developer will be responsible for constructing backbone utility infrastructure and providing extensions to the various neighborhoods in the Project. The dedication and construction of utility infrastructure within individual neighborhoods will be the responsibility of the builder(s) with each subdivision map for that neighborhood. Transformer and cable box locations shall be carefully planned and coordinated with the utility company, the landscape architect, and the builder to be unobtrusive and screened from public view where possible.

5.6 POLICE, FIRE, AND EMERGENCY MEDICAL SERVICES

The City of Lake Forest contracts with the Orange County Sheriff-Coroner's Department for law enforcement and protection. The community is served by the Aliso Viejo Sheriff's Station located in Aliso Viejo, approximately 10 miles south of the site. Service levels and response times to the Portola Center Planned Community are considered sufficient to meet current law enforcement needs and no additional on-site facilities are required to serve the planned development.

The City of Lake Forest contracts with the Orange County Fire Authority (OCFA) for fire and emergency medical services. The Fire Authority provides fire suppression, fire prevention (construction and maintenance inspections), and paramedic services. First responding units to the Planning Area would be from OCFA Station #42 located at 19150 Ridgeline Road approximately 0.6 miles northeast of the plan area, within the Portola Hills Planned Community. OCFA Station #42 employs three captains, three engineers and three firefighters and houses two engines. Current personnel and equipment at the fire station are adequate for life and property protection within the project site, thus, no additional on-site facilities will be required. OCFA also has automatic aid agreements with adjoining jurisdictions, as well as mutual aid agreements for brush fire response.

As a requirement of all new residential development in California, all homes within the Project will be constructed with internal fire sprinkler systems. All of the structures in the Project will be constructed to meet all applicable California Building Code and Fire Code standards and OCFA regulations for fire safe project design and building construction. Fire hydrants and connections shall be located and designed at the direction of the Orange County Fire Authority and shall be placed in plain sight and in locations that allow for quick and unobstructed access by fire personnel. The Project is surrounded on three sides by natural vegetation and, therefore, will include permanently irrigated Fuel Modification Zones around these three sides of the Project as well as vegetation management on the Project's interior slopes to protect structures and homes from the threat posed by wildland fires. More information on the layout and details of the Fuel Modification Zones is contained in Chapter Eight of this Area Plan.

5.7 SCHOOLS

The project is located within the jurisdiction of the Saddleback Valley Unified School District (SVUSD). Portola Hills Elementary School is located within the Portola Hills Planned Community within one half mile of the Project site along Saddleback Ranch Road. The Portola Center Project will result in the generation of additional school-age children who are expected to largely attend schools within the Saddleback Valley Unified School District, including Portola Hills Elementary. As part of the Portola Center Development Agreement, the Portola Center property owners entered into a School Mitigation Agreement with SVUSD. The School Mitigation Agreement requires the project to contribute approximately $2.9 million to the School District which is required to be used for modernization of the Portola Hills Elementary School. In addition, the Project Developer will pay a per unit fee of $8,415 for every home built in Portola Center to the school district for a total contribution of more than $10.7 million to the School District.