INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Verma Apartments Project

Prepared for:

City of Dinuba
405 E. El Monte Way
Dinuba, CA 93618
(559) 591-5900
Contact: Karl Schoettler

Prepared by:

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TABLE OF CONTENTS

PROJECT INFORMATION

This document is the Initial Study for the potential environmental effects of the Verma Apartments Project (Project) proposed in the City of Dinuba (City). To accommodate this Project, the City will need to approve a General Plan Amendment, Zone Change, and Site Plan Review. The City of Dinuba will act as the Lead Agency for this project pursuant to the California Environmental Quality Act (CEQA) and the CEQA Guidelines. Copies of all materials referenced in this report are available for review in the project file during regular business hours at the Dinuba Public Works Department at 1088 E. Kamm Ave, Dinuba, CA 93618.

Project title

Verma Apartments Project

Lead agency name and address

City of Dinuba
1088 E Kamm Ave
Dinuba, CA 93618

Contact person and phone number

Karl Schoettler
City of Dinuba
(559) 591-5924
Email: karls@4-creeks.com

Project location

The City of Dinuba lies in the Central San Joaquin Valley region, in the northwestern portion of Tulare County (see Figure 1). The City is approximately eight miles northeast of State Route (SR) 99 and 5.5 miles west of SR 63. The proposed Project site is located in western Dinuba, inside the City limits, north of Surabian Drive and south of W. El Monte Way (see Figure 2). The proposed development is located on an approximately 5.75-acre site on Assessor's Parcel Number 017-280-003 (see Figure 3).

Project sponsor's name/address

Jacob Cornejo
2021 Westwind Drive
Bakersfield, CA 93301

General plan designation

Existing: Light Industrial

Proposed: Residential – High Density

Zoning

Existing: M-1 (Light Industrial)

Proposed: RM-1 (High Density Residential)

Project Description

The Project Applicant intends to develop a 126-unit multi-family development on a 5.75-acre site. The development will also include a community center, pool, playground, internal access roads, lighting and other associated improvements (see Figure 3 for Site Plan).

Project Components

- Development of a 126-unit multi-family development including
  - 1 – Community building
  - 2 – 9-unit buildings containing six 3-bedroom units and three 1-bedroom units
  - 9 – 12-unit buildings containing twelve 2-bedroom units.
- 295 parking stalls
- Construction of internal roads, landscaping, and a block wall per City Standards
- Construction of curb, gutter and sidewalks, per City Standards
- Connection to City utilities, including stormwater, sewer and water
- Approval of Zone change from M-1 to RM-1
- Approval of a General Plan Amendment from Light Industrial to High Density Residential

Site Circulation

Access to and from the Project site will be from two points along a new frontage road accessed by

Surabian Drive.

Surrounding Land Uses/Existing Conditions

The Project site is currently vacant and is regularly disced for weed control. The Project site is sparsely vegetated, mainly with ruderal, nonnative grasses and forbs.

Lands surrounding the proposed Project are described as follows:

- North: Dinuba Town Ditch, SJVR Railroad Tracks, Commercial businesses
- South: Surabian Drive, agricultural fields, Distribution Center (Ruiz Foods)
- East: Holiday Inn, ARCO gasoline station
- West: Vacant land, Walmart Supercenter and Parking lot

Other Public Agencies Involved

- Approval of a Zone Change by the City of Dinuba
- Approval of a General Plan Amendment by the City of Dinuba
- Approval of a Site Plan Review by the City of Dinuba
- Approval of Building Permits by the City of Dinuba
- Adoption of a Mitigated Negative Declaration by the City of Dinuba
- State of California Native American Heritage Commission
- San Joaquin Valley Air Pollution Control District
- Central Valley Regional Water Quality Control Board
- Compliance with other federal, state and local requirements

Tribal Consultation

The City of Dinuba has not received any Project-specific requests from any Tribes in the geographic area with which it is traditionally and culturally affiliated with or otherwise to be notified about projects in the City of Dinuba.

Figure 1 – Location

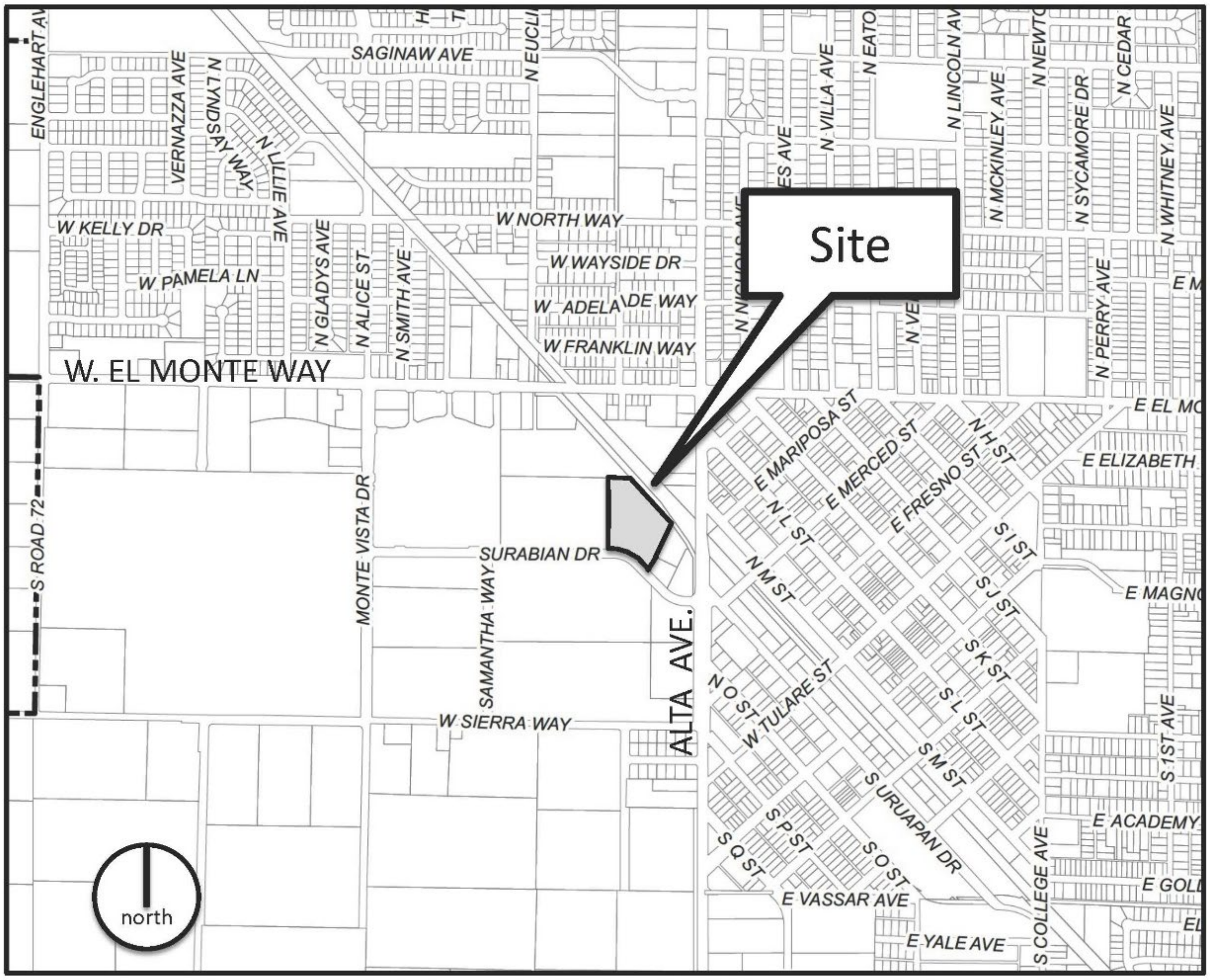

Figure 2 – Site Aerial

Figure 3 – Site Plan

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources and Forest Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology / Soils	☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials
☐ Hydrology / Water Quality	☐ Land Use / Planning	☐ Mineral Resources
☐ Noise	☐ Population / Housing	☐ Public Services
☐ Recreation	☐ Transportation	☐ Tribal Cultural Resources
☐ Utilities / Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

DETERMINATION

On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

For Karl Schoettler　　　　7/24/24

Karl Schoettler　　　　Date
Planning Consultant
City of Dinuba

ENVIRONMENTAL CHECKLIST

I. AESTHETICS **Would the project:**	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c. 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 regulations governing scenic quality?	☐	☐	☒	☐
d. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The Project site currently supports a recently disced agricultural field. The Project site is otherwise sparsely vegetated, mainly with ruderal, nonnative grasses and forbs. An earthen agricultural drainage ditch (Dinuba Town Ditch) spans the diagonal northeast boundary of the Project site. Surrounding the proposed Project are Dinuba Town Ditch, a portion of San Joaquin Valley Railroad, and commercial businesses to the north; Surabian Drive, agricultural row crops and a large distribution center (Ruiz Foods) to the south; Holiday Inn and ARCO Gasoline Station to the east; and vacant land and a Walmart Supercenter/ parking lot to the west.

RESPONSES

a) Have a substantial adverse effect on a scenic vista?

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Less Than Significant Impact. The Project Applicant intends to develop a 126-unit residential apartment complex on an approximately 5.75-acre site in western Dinuba.

A scenic vista is defined as a viewpoint that provides expansive views of highly valued landscape for the benefit of the general public. The site consists of recently disked inactive agricultural land. The City of Dinuba does not identify any scenic vistas within the Project area. Tulare County identifies El Monte Way/Avenue 416 as part of a system of County scenic routes according to the Tulare County General Plan.[1] However, the proposed Project is located approximately 400 feet south of the road, and separated by intervening land uses. Therefore, views from this roadway to scenic resources would be unaffected by the development of the Project. There are no officially designated or eligible State Scenic Highways near the Project area. The Project has a ***less than significant impact*** on scenic vistas or designated scenic resources or highways.

Mitigation Measures: None are required.

c) 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 regulations governing scenic quality?

Less than Significant Impact. The proposed Project would alter the existing visual character of public views of the site from vacant land to fully developed single-family residences. Upon approval of the General Plan Amendment and Zone Change, the Project design is subject to the City's Zoning Ordinance which contains standards that apply to site layout, building design, landscaping, interior street design, lighting, parking and signage. Per the City's Design Guidelines, detailed architectural plans, color palettes and building materials as well as landscaping plans will be submitted by the Project developer

[1] Fig 7.1, Designated Candidate Scenic State Highways and County Scenic Routes, Tulare County General Plan 2012.

to the City of Dinuba. The plans shall be required prior to issuance of any building permits. The review shall be substantially based on the building plans and elevations illustrated within this document.

The improvements such as those proposed by the Project are typical of City urban areas and are generally expected from residents of the City. These improvements would not substantially degrade the visual character of the area and would not diminish the visual quality of the area, as they would be consistent with the existing urban visual setting. The proposed Project itself is not visually imposing against the scale of the existing adjacent residential buildings and nature of the surrounding area.

Therefore, the Project would have ***less than significant impacts*** on the visual character of the area.

Mitigation Measures: None are required.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less Than Significant Impact. Nighttime lighting is necessary to provide and maintain safe, secure, and attractive environments; however, these lights have the potential to produce spillover light and glare and waste energy, and if designed incorrectly, could be considered unattractive. Light that falls beyond the intended area is referred to as "light trespass". Types of light trespass include spillover light and glare. Minimizing all these forms of obtrusive light is an important environmental consideration. A less obtrusive and well-designed energy efficient fixture would face downward, emit the correct intensity of light for the use, and incorporate energy timers.

Spillover light is light emitted by a lighting installation that falls outside the boundaries of the property on which the installation is sited. Spillover light can adversely affect light-sensitive uses, such as residential neighborhoods at nighttime. Because light dissipates as it travels from the source, the intensity of a light fixture is often increased at the source to compensate for the dissipated light. This can further increase the amount of light that illuminates adjacent uses. Spillover light can be minimized by using only the level of light necessary, and by using cutoff type fixtures or shielded light fixtures, or a combination of fixture types.

Glare results when a light source directly in the field of vision is brighter than the eye can comfortably accept. Squinting or turning away from a light source is an indication of glare. The presence of a bright light in an otherwise dark setting may be distracting or annoying, referred to as discomfort glare, or it may diminish the ability to see other objects in the darkened environment, referred to as disability glare. Glare can be reduced by design features that block direct line of sight to the light source and that direct light downward, with little or no light emitted at high (near horizontal) angles, since this light would travel long distances. Cutoff-type light fixtures minimize glare because they emit relatively low-intensity light at these angles.

Current sources of light in the Project area are from adjacent commercial and agricultural uses, including streetlights from the Walmart parking lot to the west, and the other commercial businesses to the east and north. The Project would necessitate street lighting and such lighting that would be subject to City standards. Accordingly, potential impacts would be considered ***less than significant***.

Mitigation Measures: None are required.

II. AGRICULTURE AND FOREST RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. 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?	☐	☐	☐	☒
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d. Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e. 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?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The proposed Project site is located in western Dinuba, inside the City's limits, in Tulare County within the San Joaquin Valley, California.

RESPONSES

a) 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?

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

d) Result in the loss of forest land or conversion of forest land to non-forest use?

e) 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?

No Impact. The proposed site is designated as *Farmland of Local Importance* by the State Farmland Mapping and Monitoring Program (FMMP).[2] No land under Williamson Act contract occurs in the proposed Project area. The site is located within the City's limits and is currently designated and zoned for industrial uses. Upon approval, the site will be designated for residential uses. Any potential impacts resulting from the conversion of agricultural land were analyzed in the City of Dinuba General Plan EIR (SCH#2006091107) at the time the site was designated for industrial uses. The Project site is on the valley floor and as such, does not contain forest or timberland. As such, there are ***no impacts***.

Mitigation Measures: None are required.

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[2] California Important Farmland Finder, Department of Conservation. https://maps.conservation.ca.gov/DLRP/CIFF/. Accessed June 2024.

III. AIR QUALITY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c. Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d. Result in other emissions (such as those leading to odors or adversely affecting a substantial number of people)?	☐	☐	☒	☐

The following information was provided by an Air Quality, Energy, and Greenhouse Gas Emissions Technical Memorandum that was performed on behalf of the proposed Project by LSA (consulting firm), report date May 30, 2024. The report can be read in its entirety in Appendix A.

RESPONSES

a) <u>Conflict with or obstruct implementation of the applicable air quality plan?</u>

Less Than Significant Impact. The proposed Project site is located in western Dinuba, inside the City limits, north of Surabian Drive and south of W. El Monte Way. The Project includes construction of a 126-unit multi-family development on a 5.75-acre site. The development will also include a community center, pool, playground, internal access roads, lighting and other associated improvements

The proposed Project is in a region classified as a nonattainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State air quality standards. To bring the San Joaquin Valley into attainment, the San Joaquin Valley Air Pollution Control District (SJVAPCD) adopted the 2022 Plan for the 2015 8-Hour Ozone Standard in December 2022 to satisfy Clean Air Act requirements and ensure attainment of the 75 parts per billion (ppb) 8-hour ozone standard.

To ensure the San Joaquin Valley's Air Basin's (Basin) continued attainment of the USEPA PM10 standard, the SJVAPCD adopted the 2007 PM10 Maintenance Plan in September 2007. The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards in November 2018 to address the USEPA 1997 annual PM2.5 standard of 15 μg/m3 and 24-hour PM2.5 standard of 65 μg/m3, the 2006 24-hour PM2.5 standard of 35 $\mu g/m^3$, and the 2012 annual PM2.5 standard of 12 $\mu g/m^3$.

CEQA requires that certain proposed projects be analyzed for consistency with the applicable air quality plan. For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from a project should not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below, the proposed project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Therefore, the proposed project would not conflict with or obstruct the implementation of SJVAPCD air quality plans. The impact would be ***less than significant***.

Mitigation Measures: None are required.

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Less Than Significant Impact with Mitigation Incorporation. The Basin is currently designated nonattainment for the federal and State standards for O3 and PM2.5. In addition, the Basin is in nonattainment for the PM10 standard. The Basin's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of an ambient air quality standard. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the SJVAPCD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. The following analysis assesses the potential construction- and operation-related air quality impacts.

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by excavation activities. Emissions from construction equipment are also anticipated and would include CO, NOx, volatile organic compounds (VOCs), directly emitted PM2.5 or PM10, and toxic air contaminants such as diesel exhaust particulate matter.

Project construction would include site preparation, grading, building construction, paving, and architectural coating activities. Construction-related effects on air quality from the proposed project would be greatest during the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM10 emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM10 emissions would depend on soil moisture, silt content of soil, wind speed, and amount of operating equipment. Larger dust particles would settle near the source, whereas fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The SJVAPCD has established Regulation VIII measures for reducing fugitive dust emissions (PM10). With the implementation of Regulation VIII measures, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM10 emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, sulfur oxides (SOx), NOx, VOCs, and some soot particulate (PM2.5 and PM10) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using CalEEMod and are summarized in Table 1. Attachment B in Appendix A provides CalEEMod output sheets.

Table 1 – Short-Term Regional Construction Emissions

Construction Year	Maximum Daily Regional Pollutant Emissions (Tons per Year)					
	ROG	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
2024	0.1	1.2	1.1	<0.1	0.1	0.1
2025	0.5	1.6	1.5	<0.1	0.1	0.1
Maximum Emissions	0.5	1.6	1.5	<0.1	0.1	0.1
SJVAPCD Threshold	**10.0**	**10.0**	**100.0**	**27.0**	**15.0**	**15.0**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (May 2024).
CO = carbon monoxide
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_x = sulfur oxides

As shown in Table 1, construction emissions associated with the proposed Project would not exceed the SJVAPCD's thresholds for reactive organic gas (ROG), NOx, CO, SOx, PM10, and PM2.5 emissions. In addition to the construction period thresholds of significance, the SJVAPCD has implemented Regulation VIII measures for dust control during construction. Implementation of Regulatory Compliance Measure (RCM) AIR-1 would ensure that the proposed project complies with Regulation VIII.

AIR-1: Consistent with San Joaquin Valley Air Pollution Control District (SJVAPCD) Regulation VIII (Fugitive PM10 Prohibitions), the following controls shall be required to be included as specifications for the proposed Project and implemented at the construction site:

• All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant or covered with a tarp or other suitable cover or vegetative ground cover.

• All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

• All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.

• When materials are transported off site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container shall be maintained.

• All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)

• Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/ suppressant.

Construction emissions associated with the proposed Project would be less than significant with implementation of AIR-1. Therefore, construction of the proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard.

Operational Air Quality Impacts. Long-term air pollutant emission impacts associated with the proposed Project are those related to mobile sources (e.g., vehicle trips), energy sources (e.g., natural gas), and area sources (e.g., architectural coatings and the use of landscape maintenance equipment).

Mobile source emissions include ROG and NOX emissions that contribute to the formation of ozone. Additionally, PM10 emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways.

Energy source emissions result from activities in buildings for which natural gas is used. The quantity of emissions is the product of usage intensity (i.e., the amount of natural gas) and the emission factor of the fuel source. However, the proposed project would not include natural gas and no natural gas demand is anticipated during operation of the proposed Project.

Typically, area source emissions consist of direct sources of air emissions located at the Project site, including architectural coatings and the use of landscape maintenance equipment. Area source emissions associated with the project would include emissions from the use of landscaping equipment and the use of consumer products.

Long-term operational emissions associated with the proposed Project were calculated using CalEEMod. Table 2 provides the proposed project's estimated operational emissions. Attachment B in Appendix A provides CalEEMod output sheets.

Table 2 – Project Operational Emissions

Emission Type	Pollutant Emissions (Tons per Year)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Mobile Sources	0.6	0.5	3.5	<0.1	0.6	0.2
Area Sources	0.6	<0.1	0.6	<0.1	<0.1	<0.1
Energy Sources	0.0	0.0	0.0	0.0	0.0	0.0
Total Project Emissions	**1.2**	**0.5**	**4.1**	**<0.1**	**0.6**	**0.2**
SJVAPCD Threshold	10.0	10.0	100.0	27.0	15.0	15.0
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (May 2024).
Note: Some values may not appear to add correctly due to rounding.
CO = carbon monoxide
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_X = sulfur oxides

The results shown in Table 2 indicate the proposed Project would not exceed the significance criteria for daily ROG, NOX, CO, SOX, PM10, or PM2.5 emissions. Therefore, operation of the proposed Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

Long-Term Microscale (CO Hot Spot) Analysis. Vehicular trips associated with the proposed Project would contribute to congestion at intersections and along roadway segments in the vicinity of the proposed Project site. Localized air quality impacts would occur when emissions from vehicular traffic increase as a result of the proposed Project. The primary mobile-source pollutant of local concern is CO, a direct function of vehicle idling time and, thus, of traffic flow conditions. CO transport is extremely limited; under normal meteorological conditions, it disperses rapidly with distance from the source. However, under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels, affecting local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients).

Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentrations, modeling is recommended to determine a project's effect on local CO levels.

An assessment of project-related impacts on localized ambient air quality requires that future ambient air quality levels be projected. Existing CO concentrations in Tulare County are not available. The highest CO concentrations would normally occur during peak traffic hours; hence, CO impacts calculated under peak traffic conditions represent a worst-case analysis. Reduced speeds and vehicular congestion at intersections result in increased CO emissions.

As described, the proposed Project is estimated to generate 883 average daily trips. Therefore, given the extremely low level of CO concentrations in the Project area and the lack of traffic impacts at any intersections, Project-related vehicles are not expected to result in CO concentrations exceeding the State or federal CO standards. No CO hot spots would occur, and the Project would not result in any project-related impacts on CO concentrations.

With mitigation incorporation, this impact will be ***less than significant***.

Mitigation Measures: See AIR-1 above.

c. <u>Expose sensitive receptors to substantial pollutant concentrations?</u>

Less Than Significant Impact. Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter. The Project site is surrounded primarily by retail and commercial uses. The closest sensitive receptors to the Project site include a multifamily residential building located east of the project site across Alta Avenue at approximately 450 feet. Construction of the proposed Project may expose surrounding sensitive receptors to airborne particulates, as well as a small quantity of construction equipment pollutants (i.e., usually diesel fueled vehicles and equipment). However, construction contractors would be required to implement AIR-1. Construction activities associated with the proposed Project would occur over a short timeframe, under 14 months, and therefore would expose potential sensitive receptors to emissions associated with construction activities for a limited duration. Construction emissions would be temporary in nature and limited to the immediate area surrounding the construction site. As identified above, sensitive receptors are located over 450 feet to the east of the proposed Project site and across Alta Avenue; therefore, this distance is sufficient that particulate matter would settle prior to reaching the nearest sensitive receptors. In addition, as shown in Table 1, construction emissions associated with the proposed Project would not exceed the SJVAPCD's thresholds for ROG, NOX, CO, SOX, PM10, and PM2.5 emissions. Therefore, with implementation of AIR-1, project construction pollutant emissions would be below the SJVAPCD significance thresholds and are not expected to result in the exposure of sensitive receptors to substantial pollutant concentrations.

The proposed Project would include the construction of a 126-unit multifamily residential development. As identified in Table 2, Project operational emissions of criteria pollutants would be below SJVAPCD significance thresholds; thus, they are not likely to have a significant impact on sensitive receptors. In addition, the proposed project would be required to implement District Rule 9510, Indirect Source Review (ISR). Implementation of Rule 9510 would reduce operational emissions of NOX and PM10 by 33.3 percent and 50 percent, respectively. Compliance with SJVAPCD rules would further limit doses and exposures, reducing potential health risk related to gasoline vapors to a level that is not significant. Once the proposed project is constructed, the proposed project would not be a source of substantial emissions. Therefore, implementation of the proposed project would not result in new sources of TACs. Therefore, the Project would not expose sensitive receptors to substantial levels of TACs.

Valley Fever

The closest sensitive receptors to the Project site include a multifamily residential building located east of the Project site across Alta Avenue at approximately 450 feet. Except under high wind conditions, this distance is sufficient that particulate matter would settle prior to reaching the nearest sensitive receptor. In addition, crosswinds influenced by the adjacent roadways would help dissipate any particulate matter associated with the construction phase of the project. Therefore, any Valley fever spores suspended with the dust would not be anticipated to reach the sensitive receptors. However, during project construction, it is possible that workers could be exposed to Valley fever through fugitive dust. Dust control measures, consistent with SJVAPCD Regulation VIII, would reduce the exposure to the workers and sensitive receptors. Therefore, dust from the construction of the Project is not anticipated to significantly add to the existing exposure of people to Valley fever.

Naturally Occurring Asbestos

The Project is located in Tulare County, which is among the counties found to have serpentine and ultramafic rock in their soils. However, according to the California Geological Survey, no such rock has been identified in the Project vicinity. When demolition is proposed during construction, the demolition of existing buildings may expose asbestos used in building materials. However, the proposed Project would not involve any demolition or renovation as no current development exists on the project site. Therefore, the potential risk for naturally occurring asbestos during project construction is small and would not be significant.

Conclusion

In summary, the Project would not exceed SJVAPCD localized emission daily screening levels for any criteria pollutant. The Project is not a significant source of TAC emissions during construction or operations. The Project is not in an area with suitable habitat for Valley fever spores and is not in an area known to have naturally occurring asbestos. Therefore, the Project would not result in significant impacts to sensitive receptors and impacts are ***less than significant.***

d. <u>Result in other emissions (such as those leading to odors adversely affecting a substantial number of people?</u>

Less Than Significant Impact. The SJVAPCD addresses odor criteria within the GAMAQI and has not established a rule or standard regarding odor emissions, rather, the district has a nuisance rule: "Any project with the potential to frequently expose members of the public to objectionable odors should be deemed to have a significant impact." During project construction, some odors may be present due to diesel exhaust. However, these odors would be temporary and limited to the construction period. The proposed residentail uses are not anticipated to emit any objectionable odors. Any odors in general would be confined mainly to the Project site and would readily dissipate. Therefore, the proposed Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. The impacts would be ***less than significant***.

Mitigation Measures: None are required.

IV. BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. 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?	☐	☐	☒	☐
b. 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 U.S. Fish and Wildlife Service?	☐	☐	☒	☐
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d. 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?	☐	☒	☐	☐

e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f.	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The proposed Project site is located in a portion of the central San Joaquin Valley that has, for decades, experienced intensive agricultural and urban disturbances. Current agricultural endeavors in the region include dairy, cattle, groves, and row crops.

Like most of California, the Central San Joaquin Valley experiences a Mediterranean climate. Warm dry summers are followed by cool moist winters. Summer temperatures usually exceed 90 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely raise much above 70 degrees Fahrenheit, with daytime highs often below 60 degrees Fahrenheit. Annual precipitation within the proposed Project area is about 10 inches, almost 85% of which falls between the months of October and March. Nearly all precipitation falls in the form of rain and storm-water readily infiltrates the soils of the surrounding the site.

Native plant and animal species once abundant in the region have become locally extirpated or have experienced large reductions in their populations due to conversion of upland, riparian, and aquatic habitats to agricultural and urban uses. Remaining native habitats are particularly valuable to native wildlife species including special status species that still persist in the region.

The site is currently vacant. The Project site's surrounding lands consist primarily of single-family residences, commercial businesses, vacant land and agriculture.

One potentially regulated habitat, Dinuba Town Ditch, was found just outside the Project area: an earthen agricultural drainage ditch along the diagonal northern boundary of the Project. Dinuba Town Ditch is listed in the National Wetlands Inventory as a riverine system with a classification of R5UBFx, which means riverine, unknown perennial, unconsolidated bottom, semi-permanently flooded, and excavated. No aquatic or wetland features occur within the proposed Project site; therefore, jurisdictional waters are considered absent from the site.

RESPONSES

a) 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?

Less Than Significant Impact. The site is currently fallow and regularly disced for fire suppression. The site is in an area that is highly disturbed and lacking in substantial vegetation, such as trees, brush or shrubs. This factor suggests that the Project site is extremely unlikely to serve as nesting habitat for bird species or any animal or plant species. No wetlands or waters of the U.S. or water of the State were found within the Project area. Additionally, according to the City of Dinuba General Plan DEIR, Occurrences of Special Status Species Figure 3.4-1, the only listed species is the San Joaquin Adobe Sunburst (*Pseudobahia peirsonii*). Table 3.4-1 goes on to state that there is a 1927 record of this plant occurring near the Project site; however, all habitat that would support this species has been eliminated and this population is no longer extant. Therefore, there is no potential for special status species to exist in the area. Any impacts to special status species are considered ***less than significant.***

Mitigation Measures: None are required.

b) 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 U.S. Fish and Wildlife Service?

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Less Than Significant Impact. The Dinuba Town Ditch borders the Project site outside the northern and eastern periphery and is outside of the Project impact area. The Ditch will not be affected by the proposed residential apartment complex. The proposed Project will not 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 CDFW or USFWS as no riparian habitat or other sensitive natural community is present in the survey area. The proposed Project will not 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 as no impacts to wetlands will occur. As such, there will be ***less than significant impacts.***

Mitigation Measures: None are required.

d) 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 Impact with Mitigation. There are no natural waterways or natural vegetation on the Project site, and the site is not used for movement of wildlife species or for a migratory wildlife corridor, nor is the site used for native wildlife nursery sites. The parcel is currently vacant land with minimal vegetation. The site is highly disturbed; however, in the event that migratory and/or native avian species are nesting within or adjacent to the proposed Project area at the time of construction, construction activities could result in nest abandonment and/or direct mortality to individual birds. Project activities that injure or kill native birds or lead to nest abandonment would violate the California Fish and Game Code. The implementation of BIO-1 would ensure that potential impacts remain ***less than significant***.

Mitigation Measures:

BIO-1. Protect nesting birds.

To the extent practicable, construction shall be scheduled to avoid the nesting season, which extends from February through August. If it is not possible to schedule construction between September and January, pre-construction surveys for nesting birds shall be conducted by a qualified biologist to ensure that no active nests will be disturbed during the implementation of the Project. A pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all potential nest substrates in and immediately adjacent to the impact areas. If an active nest is found close enough to the construction area to be disturbed by these activities, the qualified biologist shall determine the extent of a construction-free buffer to be established around the nest. If work cannot proceed without disturbing the nesting birds, work may need to be halted or redirected to other areas until nesting and fledging are completed or the nest has otherwise failed for non-construction related reasons.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The proposed Project is consistent with the goals and policies of the City of Dinuba General Plan and will not conflict with the General Plan's policies related to "no-net-loss" of wetlands and preservation of riparian habitats because wetlands and riparian habitats are absent from the Project site. The Project will not result in significant loss of habitat for special status animal species and will therefore be consistent with General Plan policies related to wildlife habitat. Therefore, the proposed Project would have ***no impact.***

Mitigation Measures: None are required.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No Impact. The proposed Project site is not within an area set aside for the conservation of habitat or sensitive plant or animal species pursuant to a Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. As such, there is ***no impact***.

Mitigation Measures: None are required.

V. CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☒	☐	☐
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

ENVIRONMENTAL SETTING

Archaeological resources are places where human activity has measurably altered the earth or left deposits of physical remains. Archaeological resources may be either prehistoric (before the introduction of writing in a particular area) or historic (after the introduction of writing). The majority of such places in this region are associated with either Native American or Euroamerican occupation of the area. The most frequently encountered prehistoric and early historic Native American archaeological sites are village settlements with residential areas and sometimes cemeteries; temporary camps where food and raw materials were collected; smaller, briefly occupied sites where tools were manufactured or repaired; and special-use areas like caves, rock shelters, and sites of rock art. Historic archaeological sites may include foundations or features such as privies, corrals, and trash dumps.

RESPONSES

a) <u>Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?</u>

b) <u>Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?</u>

c) <u>Disturb any human remains, including those interred outside of formal cemeteries?</u>

Less Than Significant Impact With Mitigation. A record search of the Project area and the environs within one half-mile was conducted at the Southern San Joaquin Archaeological Information Center. Information Center staff conducted the record search, RS# 24-185, on May 1, 2024 (see Appendix B). The record search revealed that there have been no previous cultural resource studies completed within the project area. There have been five cultural resource studies completed within the half-mile radius: TU-00591, TU-01069, TU-01149, TU-01289 and TU-01599.

There are no recorded resources within the Project area. There are a number of recorded resources within the half-mile radius. These resources consist of single-family properties, multi-family properties, commercial buildings, industrial buildings, ancillary building, canals, government buildings, religious buildings, a railroad, and a rail-road crossing.

There are no recorded cultural resources within the project area or radius that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, for the California State Historic Landmarks.

Although no significant cultural or archaeological resources, paleontological resources or human remains have been identified in the project area, the possibility exists that such resources or remains may be discovered during Project site preparation, excavation and/or grading activities. Mitigation Measures CUL – 1 and CUL – 2 will be implemented to ensure that Project will result in ***less than significant impacts with mitigation***.

Mitigation Measures:

CUL – 1

Should evidence of prehistoric archeological resources be discovered during construction, the contractor shall halt all work within 25 feet of the find and the resource shall be evaluated by a qualified archaeologist. If evidence of any archaeological, cultural, and/or historical deposits is found, hand excavation and/or mechanical excavation shall proceed to evaluate the deposits for determination of significance as defined by the CEQA guidelines. The archaeologist shall submit reports, to the satisfaction of the City of Dinuba, describing the testing program and subsequent results. These reports shall identify any program mitigation that the project proponent shall complete in order to mitigate archaeological impacts (including resource recovery and/or avoidance testing and analysis, removal, reburial, and curation of archaeological resources).

CUL – 2

In order to ensure that the proposed project does not impact buried human remains during construction, the project proponent shall be responsible for on-going monitoring of project construction. Prior to the issuance of any grading permit, the project proponent shall provide the City of Dinuba with documentation identifying construction personnel that will be responsible for on-site monitoring. If buried human remains are encountered during construction, further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall be halted until the Tulare County coroner is contacted and the coroner has made the determinations and notifications required pursuant to Health and Safety Code Section 7050.5. If the coroner determines that Health and Safety Code Section 7050.5(c) require that he give notice to the Native American Heritage Commission, then such notice shall be given within 24 hours, as required by Health and Safety Code Section 7050.5(c). In that event, the NAHC will conduct the notifications required by Public Resources Code Section 5097.98. Until the consultations described below have been completed, the landowner shall further ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices where Native American human remains are located, is not disturbed by further development activity until the landowner has discussed and conferred with the Most Likely Descendants on all reasonable options regarding the descendants' preferences and treatments, as prescribed by Public Resources Code Section 5097.98(b). The NAHC will mediate any disputes regarding treatment of remains in accordance with Public Resources Code Section 5097.94(k). The landowner shall be entitled to exercise rights established by Public Resources Code Section 5097.98(e) if any of the circumstances established by that provision become applicable.

VI. ENERGY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b. Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

The following information was provided by an Air Quality, Energy and Greenhouse Gas Emissions Technical Memorandum that was performed on behalf of the proposed project by LSA (consulting firm) report date May 30, 2024. The report can be read in its entirety in Appendix A.

The energy requirements for the proposed Project were determined using the construction and operational estimates generated from the Air Quality Analysis (refer to Appendix A for related CalEEMod output files). The calculation worksheets for fuel consumption rates for off-road construction equipment and on-road vehicles are provided in Appendix A.

RESPONSES

a) <u>Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?</u>

Less Than Significant Impact. This impact analysis addresses energy consumption from the short-term construction and long-term operations, discussed separately below.

Short-Term Energy Demand - Construction

The anticipated construction schedule assumes that the proposed Project would be built in approximately 14 months. Construction-specific phases were assessed for their energy consumption under each construction sub-phase: grading, site preparation, building construction, paving, and architectural coating activities.

Construction would require energy for the manufacture and transportation of construction materials, preparation of the site for grading and building activities, and construction of the building. All or most of this energy would be derived from nonrenewable resources. Petroleum fuels (e.g., diesel and gasoline) would be the primary sources of energy for these activities. However, construction activities are not anticipated to result in an inefficient use of energy as gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the project. Energy (i.e., fuel) usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources.

Operation

Energy use associated with the proposed Project would consist of electricity and vehicle fuel use associated with project operations. The proposed Project would not include natural gas, and no natural gas demand is anticipated during Project operation.

Table 3 shows the estimated potential increased electricity, gasoline, and diesel demand associated with the proposed Project. The electricity and natural gas rates are from the CalEEMod analysis, while the gasoline and diesel rates are based on the traffic analysis in conjunction with USDOT fuel efficiency data and using the USEPA's fuel economy estimates for 2020 and the California diesel fuel economy estimates for 2021.

Table 3 – Estimated Annual Energy Use of Proposed Project

	Electricity Use (kWh per year)	Natural Gas Use (kBTU per year)	Gasoline (gallons per year)	Diesel (gallons per year)
Proposed Project	671,173	0.0	56,300	45,954

Source: Compiled by LSA (May 2024).
kBTU = thousand British thermal units
kWh = kilowatt hours

As shown in Table 3, the estimated increase in electricity demand associated with the operation of the proposed Project would be 671,173 kilowatt hours (kWh) per year. Total electricity consumption in Tulare County in 2022 was 4,957,696,254 kWh;1 therefore, operation of the proposed Project would negligibly increase the annual electricity consumption in Tulare County by approximately 0.01 percent.

In addition, the Project would result in energy usage associated with motor vehicle gasoline to fuel project-related trips. As shown above in Table 3, the proposed Project would result in the consumption of 56,300 gallons of gasoline and 45,954 gallons of diesel per year. Based on fuel consumption obtained from EMFAC2021, approximately 197.1 million gallons of gasoline and approximately 65 million gallons of diesel will be consumed from vehicle trips in Tulare County in 2024. Therefore, vehicle trips associated with the proposed Project would increase the annual fuel use in Tulare County by approximately 0.03

percent for gasoline fuel usage and approximately 0.1 percent for diesel fuel usage. The proposed Project would result in fuel usage that is a small fraction of current annual fuel use in Tulare County, and fuel consumption associated with vehicle trips generated by Project operations would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region. Therefore, gasoline demand generated by vehicle trips associated with the proposed Project would be a minimal fraction of gasoline and diesel fuel consumption in California.

Furthermore, the proposed Project would be constructed using energy efficient modern building materials and construction practices, and the proposed Project also would use new modern appliances and equipment, in accordance with the Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608). The expected energy consumption during construction and operation of the proposed Project would be consistent with typical usage rates for residential uses; however, energy consumption is largely a function of personal choice and the physical structure and layout of buildings.

PG&E is the private utility that would supply the proposed Project's electricity. In 2021, a total of 50 percent of PG&E's delivered electricity came from renewable sources, including solar, wind, geothermal, small hydroelectric, and various forms of bioenergy. PG&E reached California's 2020 renewable energy goal in 2017 and is positioned to meet the State's 60 percent by 2030 renewable energy mandate set forth in SB 100. In addition, PG&E plans to continue to provide reliable service to its customers and upgrade its distribution systems as necessary to meet future demand.

For these reasons, vehicular fuel consumption associated with the proposed Project would not be any more inefficient, wasteful, or unnecessary than for any other similar land use activities in the region, and impacts would be ***less than significant***.

Mitigation Measures: None are required.

b) <u>Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?</u>

Less Than Significant Impact. The CEC recently adopted the 2023 Integrated Energy Policy Report. The 2023 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. The 2023 Integrated Energy Policy Report covers a broad range of topics, including decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecasts, and the California Energy Demand Forecast.

As indicated above, energy usage on the Project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. In addition, energy usage associated with operation of the proposed project would be relatively small in comparison to the region's available energy sources, and energy impacts would be negligible at the regional level. Because California's energy conservation planning actions are conducted at a regional level, and because the project's total impact on regional energy supplies would be minor, the proposed Project would not conflict with or obstruct California's energy conservation plans as described in the CEC's 2023 Integrated Energy Policy Report.

For the above reasons, the proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency, and impacts would be ***less than significant***.

Mitigation Measures: None are required.

VII. GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. 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.	☐	☐	☒	☐
ii. Strong seismic ground shaking?	☐	☐	☒	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv. Landslides?	☐	☐	☒	☐
b. Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c. 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?	☐	☐	☐	☒
d. Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code	☐	☐	☒	☐

	creating substantial risks to life or property?				
e.	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?	☐	☐	☐	☒
f.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

Dinuba is located near the eastern edge of the Central Valley, which is a nearly flat northwest-southeast trending basin approximately 450 miles long and approximately 75 miles wide. The City of Dinuba is located on soil types characterized by a thick section of sedimentary rock overlying a granitic basement layer. The hazards due to ground-shaking are considered low due to the relative distance of the City from seismic faults. The nearest faults are the Sierra Nevada Fault Zone (approximately 60 miles east), the San Joaquin Fault (approximately 75 miles northwest), and the San Andreas Fault (approximately 75 miles to the southwest). The City of Dinuba is located in a Seismic Zone II, as defined by the California Uniform Building Code.

RESPONSES

a-i) Expose people or structures to 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.

a-ii) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking?

a-iii) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction?

a-iv) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?

Less Than Significant Impact. The proposed Project site is located on an approximately 5.75-acre site, in western Dinuba, north of Surabian Drive and south of W. El Monte Way. The proposed site is not located in an earthquake fault zone as delineated by the 1972 Alquist-Priolo Earthquake Fault Zoning Map Act.[3] The nearest known potentially active fault is the Sierra Nevada Fault Zone, located approximately 63 miles east of the site. No active faults have been mapped within the Project boundaries, so there is no potential for fault rupture. It is anticipated that the proposed Project site would be subject to some ground acceleration and ground shaking associated with seismic activity during its design life. The proposed Project site would be engineered and constructed in strict accordance with the earthquake resistant design requirements contained in the latest edition of the California Building Code (CBC) for Seismic Zone II, as well as Title 24 of the California Administrative Code, and therefore would avoid potential seismically induced hazards on planned structures.

The proposed Project site has a generally flat topography, which would preclude the likeliness of a landslide. The impact of seismic or landslide hazards on the Project would be ***less than significant.***

Mitigation Measures: None are required.

b) Result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact. The Project Applicant intends to develop 126 apartment units on an approximately 5.75-acre site. The development will also include access roads, parking, lighting and other associated improvements. An earthen agricultural drainage ditch (Dinuba Town Ditch) spans just outside the diagonal northeastern boundary of the Project site; the Project will have no effect on the ditch.

Construction activities associated with the Project involve ground preparation work for the new housing development and associated improvements. These activities could expose barren soils to sources of wind or water, resulting in the potential for erosion and sedimentation on and off the Project site. During construction, nuisance flow caused by minor rain could flow off-site. The City and/or contractor would be required to employ appropriate sediment and erosion control BMPs as part of a Stormwater Pollution

[3] Earthquake Hazard Zones, California Department of Conservation. https://maps.conservation.ca.gov/cgs/EQZApp/app/. Accessed June 2024.

Prevention Plan (SWPPP) that would be required in the California National Pollution Discharge Elimination System (NPDES). As such, any impacts would be considered ***less than significant.***

Mitigation Measures: None are required.

c) 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?

d) Be located on expansive soil, as defined in Table 18-1-B of the most recently adopted Uniform Building Code creating substantial risks to life or property?

Less Than Significant Impact. See Section VI a. above. The site is not at significant risk from ground shaking, liquefaction, or landslide and is otherwise considered geologically stable. The City of Dinuba sits on top of a mix of different loam classifications; with the predominant soils in the proposed Project area Tujunga Loamy Sand and Flamen Loamy soil.[4] These soil types are characterized as moderately well drained to somewhat excessively drained, with negligible to low runoff. These soils also have low shrink/swell potential, which is generally not conducive to liquefaction. Additionally, liquefaction typically occurs when there is shallow groundwater, low-density non-plastic soils, and high-intensity ground motion.

The City of Dinuba is on relatively flat terrain which precludes the occurrence of landslides. Subsidence is typically related to over-extraction of groundwater from certain types of geologic formations where the water is partly responsible for supporting the ground surface. The City of Dinuba is not recognized by the U.S. Geological Service as being in an area of subsidence.[5] Additionally, ongoing potential impacts of groundwater depletion and subsidence are constantly being monitored by USGS through a system of extensometers positioned throughout the San Joaquin Valley. Continuous measurements and aquifer-system response analysis enables appropriate governing of parameters set to mitigate subsidence impacts in the region. Impacts are considered ***less than significant***.

Mitigation Measures: None are required.

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[4] U.S. Department of Agriculture. Natural Resource Conservation Service. Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/app/WebSoilSurvey.aspx. Accessed June 2024.

[5] U.S. Geological Service. Areas of Land Subsidence in California. https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html Accessed June 2024.

e) 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?

No Impact. The proposed Project does not include the construction, replacement, or disturbance of septic tanks or alternative wastewater disposal systems. The Project will be required to tie into the existing City sewer system (See Utilities section for more details). Therefore, there is ***no impact.***

Mitigation Measures: None are required.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant Impact. As identified in the cultural studies performed for the Project site (see Appendix B), there are no known paleontological resources on or near the site. Mitigation measures have been added that will protect unknown (buried) resources during construction, including paleontological resources. There are no unique geological features on site or in the area. Therefore, there is a ***less than significant impact***.

Mitigation Measures: None are required.

VIII. GREENHOUSE GAS EMISSIONS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

The following information was provided by an Air Quality, Energy and Greenhouse Gas Emissions Technical Memorandum that was performed on behalf of the proposed project by LSA (consulting firm) report date May 30, 2024. The report can be read in its entirety in Appendix A.

RESPONSES

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant Impact. The following sections describe the proposed Project's construction- and operation-related GHG impacts and consistency with applicable GHG reduction plans.

Construction Greenhouse Gas Emissions

Construction activities associated with the proposed Project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO2, CH4, and N2O. Furthermore, CH4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The SJVAPCD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction. Using CalEEMod, it is estimated that the annual emissions associated with construction of the proposed Project would be approximately 406.5 metric tons of CO2e per year. Construction GHG emissions were amortized over the life of the Project (assumed to be 30 years) and added to the operational emissions. When annualized over the life of the project, amortized construction emissions would be approximately 13.6 MT CO2e per year.

Operational Greenhouse Gas Emissions

Long-term GHG emissions are typically generated from mobile sources (e.g., vehicle and truck trips), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, waste sources (land filling and waste disposal), and water sources (water supply and conveyance, treatment, and distribution). Mobile-source GHG emissions would include Project-generated vehicle trips to and from the site. Area-source emissions would be associated with activities such as landscaping and maintenance on the Project site. Energy source emissions would be generated at off-site utility providers as a result of increased electricity demand generated by the Project. Waste source emissions generated by the proposed Project include energy generated by land filling and other methods of disposal related to transporting and managing Project generated waste. In addition, water source emissions associated with the proposed Project are generated by water supply and conveyance, water treatment, water distribution, and wastewater treatment.

Following guidance from the SJVAPCD, GHG emissions for Project operations were calculated using CalEEMod. Based on the analysis results, summarized in Table 4, the proposed Project would result in emissions of approximately 776.1 MT CO2e per year. These estimated emissions are provided for informational purposes, and the significance of the proposed Project is further analyzed below.

Table 4 – Greenhouse Gas Emissions

Emission Type	Operational Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Mobile Sources	645.8	<0.1	<0.1	659.6
Area Sources	1.6	<0.1	<0.1	1.6
Energy Sources	62.1	<0.1	<0.1	62.7
Water Sources	3.9	0.2	<0.1	9.5
Waste Sources	8.3	0.8	0.0	29.1
Amortized Construction Emissions				13.6
Total Operational Emissions				**776.1**

Source: Compiled by LSA (May 2024).
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
N_2O = nitrous oxide

As discussed, the SJVAPCD has not established a numeric threshold for GHG emissions. The significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds or consistency with a regional GHG reduction plan (such as a Climate Action Plan). Neither the City nor the SJVAPCD has developed or adopted numeric GHG significance thresholds. Therefore, the proposed Project was analyzed for consistency with the 2022 Scoping Plan.

The 2022 Scoping Plan includes key project attributes that reduce operational GHG emissions in Appendix D, Local Actions, of the 2022 Scoping Plan. As discussed in Appendix D of the 2022 Scoping Plan, absent consistency with an adequate, geographically specific GHG reduction plan such as a CEQA-qualified CAP, the first approach the State recommends for determining whether a proposed residential or mixed-use residential development would align with the State's climate goals is to examine whether the project includes key project attributes that reduce operational GHG emissions.

The Project's consistency with key project attributes from the 2022 Scoping Plan that would be applicable to residential and mixed-use development is shown in Table 5.

Residential and mixed-use projects that have all of the key project attributes as outlined in Table 5 in the memorandum would be considered to accommodate growth in a manner consistent with State GHG reduction and equity prioritization goals as outlined in the 2022 Scoping Plan.

The proposed Project would be consistent with the 2022 Scoping Plan key residential and mixed-use project attributes related to EV charging requirements and building electrification. Therefore, the proposed Project would be consistent with all project attributes in the 2022 Scoping Plan GHG emission thresholds. As such, the proposed Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Table 5 – Project Consistency with the 2022 Scoping Plan Key Residential and Mixed Use Project Attributes That Reduce GHGs

Priority Areas	Key Project Attribute	Project Consistency
Transportation Electrification	Provides EV charging infrastructure that, at minimum, meets the most ambitious voluntary standard in the California Green Building Standards Code at the time of project approval.	***Consistent.*** CALGreen requires provision of infrastructure to accommodate EV chargers. The proposed project would provide electric vehicle charging to comply with the CALGreen code, which requires 10 percent of the total parking spaces to be equipped with Level 2 EV chargers and that at least half of the required EV chargers be equipped with J17772 connectors. Therefore, the proposed project would be consistent with this key project attribute.
VMT Reduction	Is located on infill sites that are surrounded by existing urban uses and reuses or redevelops previously undeveloped or underutilized land that is presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer).	***Consistent***. The project site is located in an area with a mix of land uses, including residential and commercial, uses that are presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer). Therefore, the proposed project would be consistent with this key project attribute.
	Does not result in the loss or conversion of natural and working lands.	***Consistent.*** The project site is not zoned for agricultural uses. The State Department of Conservation classifies the project site as Non-Enrolled Land. The project site is not located on land that is designated as Prime Farmland or Farmland of State Importance. In addition, the project site is currently vacant and is not zoned for agricultural uses. As such, the proposed project would be consistent with this key project attribute.
	Consists of transit-supportive densities (minimum of 20 residential dwelling units per acre) or Is in proximity to existing transit stops (within a half mile), or satisfies more detailed and stringent criteria specified in the region's SCS.	***Consistent.*** The proposed project would include the construction of 126 multifamily units on a 250,568 sq ft (5.75 acres) project site. Therefore, the proposed project would result in 21 residential dwelling units per acre. In addition, the project site is located within 0.5 mile of a transit stop. The proposed project would also provide pedestrian infrastructure connecting to neighboring uses. As such, the project would promote initiatives to reduce vehicle trips and VMT and would increase the use of alternate means of transportation. As such, the proposed project would be consistent with this key project attribute.
	Reduces parking requirements by: eliminating parking requirements or including maximum allowable parking ratios (i.e., the ratio of parking spaces to residential units or square feet); or providing residential parking supply at a ratio of less than one parking space per dwelling unit; or for multifamily residential development, requiring parking costs to be unbundled from costs to rent or own a residential unit.	***Consistent.*** The proposed project would consist of 126 multifamily units and would provide 295 parking spaces throughout the project site. Based on the proposed uses when compared to the number of parking spaces, the proposed project would not include reduced parking. However, future tenants would be able to implement unbundled parking costs, as feasible. Moreover, the project site is located within 0.5 mile of a transit stop. The proposed project would also provide pedestrian infrastructure connecting to neighboring uses. As such, the project would promote initiatives to reduce vehicle trips and VMT and would increase the use of alternate means of

Table 5 – Project Consistency with the 2022 Scoping Plan Key Residential and Mixed Use Project Attributes That Reduce GHGs

Priority Areas	Key Project Attribute	Project Consistency
		transportation. Although the proposed project would not have reduced parking, it would still be consistent with the intent of this measure for reducing VMT.
	At least 20 percent of units included are affordable to lower-income residents.	***Consistent.*** The proposed project would not include affordable residential units. However, the proposed project would include residential units that would be in close proximity to commercial uses and would allow residents to live within walking distance to the commercial zones. Although the proposed project would not include affordable housing, the proposed project would provide needed multifamily housing. Therefore, the proposed project would be consistent with this key project attribute.
	Results in no net loss of existing affordable units.	***Consistent.*** The proposed project would not result in the removal of any existing residential units. As such, the proposed project would be consistent with this key project attribute.
Building Decarbonization	Uses all-electric appliances without any natural gas connections and does not use propane or other fossil fuels for space heating, water heating, or indoor cooking.	***Consistent.*** The proposed project would be consistent with State building code requirements as Title 24 advances to implement the building decarbonization goals from the 2022 Scoping Plan. As such, the proposed project would be consistent with this key project attribute.

Source: Compiled by LSA (May 2024).
EV = electric vehicle
SCS = Sustainable Communities Strategy
sq ft = square foot
VMT = vehicle miles traveled.

Consistency with Greenhouse Gas Reduction Plans

As demonstrated in the preceding section, the proposed Project would be consistent with the 2022 Scoping Plan key project attributes for residential and mixed-use projects.

The proposed project is further analyzed for consistency with the goals of the 2022 Scoping Plan and Tulare County's RTP.

2022 Scoping Plan

The following discussion evaluates the proposed Project according to the goals of the 2022 Scoping Plan, EO B-30-15, SB 32, and AB 197.

EO B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,2 to reflect the 2030 target set by EO B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. SB 32 builds on AB 32 and keeps California on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

In addition, the 2022 Scoping Plan assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

The 2022 Scoping Plan focuses on building clean energy production and distribution infrastructure for a carbon-neutral future, including transitioning existing energy production and transmission infrastructure to produce zero-carbon electricity and hydrogen, and utilizing biogas resulting from wildfire management or landfill and dairy operations, among other substitutes. The 2022 Scoping Plan states that in almost all sectors, electrification will play an important role. The 2022 Scoping Plan evaluates clean energy and technology options and the transition away from fossil fuels, including adding four times the solar and wind capacity by 2045 and about 1,700 times the amount of current hydrogen supply. As discussed in the 2022 Scoping Plan, EO N-79-20 requires that all new passenger vehicles sold in California will be zero-emission by 2035, and all other fleets will have transitioned to zero-emission as fully possible by 2045, which will reduce the percentage of fossil fuel combustion vehicles.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. The proposed project would not be powered by natural gas, and no natural gas demand is anticipated during construction or operation of the proposed project. The elimination of natural gas in new development would help projects implement their "fair share" of achieving long-term 2045 carbon neutrality consistent with State goals. As such, if a project does not utilize natural gas, a lead agency can conclude that it would be consistent with achieving the 2045 neutrality goal and will not have a cumulative considerable impact on climate change.1 In addition, the proposed project would be required to comply with the latest Title 24 standards of the CCR, established by the CEC, regarding energy conservation and green building standards. Therefore, the proposed project would comply with applicable energy measures.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. The project would comply with the CALGreen Code, which includes a variety of different measures, including the reduction of wastewater and water use. In addition, the proposed project would be required to comply with the California Model Water Efficient Landscape Ordinance. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulting in a 3 percent decrease in average vehicle emissions for all vehicles by 2020. Vehicles traveling to the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. Therefore, the proposed Project would not conflict with the identified transportation and motor vehicle measures.

Tulare County 2022 RTP/SCS.

The TCAG RTP/SCS reflects transportation planning for Tulare County through 2046. The vision, goals, and policies in the 2022 RTP are intended to serve as the foundation for both short- and long-term planning and guide implementation activities. The core vision in the 2022 RTP is to create a region of diverse, safe, resilient, and accessible transportation options that improve the quality of life for all residents by fostering sustainability, equity, a vibrant economy, clean air, and healthy communities. The 2022 RTP contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as forecast development that is generally consistent with regional-level general plan data. The actions in the 2022 RTP address all transportation modes (highways, local streets and roads, mass transportation, rail, bicycle, aviation facilities and services) and consists of short- and long-term activities that address regional transportation needs. While the actions are organized by the five key policy areas, many of them support multiple goals and policies. Some actions are intended to support the Sustainable Communities Strategy and reduce GHG emissions directly, while others are focused on the RTP's broader goals. The 2022 RTP does not require that local General Plans, Specific Plans, or zoning be consistent with the 2022 RTP, but provides incentives for consistency for governments and developers.

The proposed Project would not interfere with the TCAG's ability to achieve the region's GHG reductions. Furthermore, the proposed project is not regionally significant per State CEQA Guidelines Section 15206 and as such, it would not conflict with the 2022 RTP targets since those targets were established and are applicable on a regional level. The proposed Project would include the construction of 126 multifamily residential units and associated site improvements. As such, the proposed Project land uses would be consistent with the growth assumptions used in the 2022 RTP. Therefore, it is anticipated that implementation of the proposed Project would not interfere with the TCAG's ability to implement the regional strategies outlined in the 2022 RTP. The proposed Project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals and would be consistent with applicable plans and programs designed to reduce GHG emissions. Therefore, the proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Conclusion

Based on the analysis presented above, the Project would not result in the emission of substantial GHG emissions. Additionally, the Project would not conflict with the State's GHG emissions reductions objectives embodied in the 2022 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197. Therefore, the proposed Project's incremental contribution to cumulative GHG emissions would not be cumulatively considerable. This impact would be ***less than significant***.

Mitigation Measures: None are required.

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b. 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?	☐	☐	☒	☐
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d. 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?	☐	☐	☐	☒
e. 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?	☐	☐	☒	☐
f. Impair implementation of or physically interfere with an adopted emergency	☐	☐	☒	☐

	response plan or emergency evacuation plan?				
g.	Expose people or structures either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The proposed Project site is located in the western portion of the City of Dinuba. The site currently supports a recently disced agricultural field.

RESPONSES

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b) 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?

Less Than Significant Impact. The Project Applicant intends to develop 126 apartments on an approximately 5.75-acre site. The development will also include access roads, parking, lighting and other associated improvements such as a community center, pool and a playground.

Surrounding the proposed Project are Dinuba Town Ditch, a portion of San Joaquin Valley Railroad, and commercial businesses to the north; Surabian Drive, agricultural row crops and a large distribution center (Ruiz Foods) to the south; Holiday Inn and ARCO Fuel Station to the east; and vacant land and a Walmart Supercenter/ parking lot to the west.

Proposed Project construction activities may involve the use and transport of hazardous materials. These materials may include fuels, oils, mechanical fluids, and other chemicals used during construction. Transportation, storage, use, and disposal of hazardous materials during construction activities would be required to comply with applicable federal, state, and local statutes and regulations. Compliance would ensure that human health and the environment are not exposed to hazardous materials. In addition, the Project would be required to comply with the National Pollutant Discharge Elimination System (NPDES) permit program through the submission and implementation of a Stormwater Pollution Prevention Plan during construction activities to prevent contaminated runoff from leaving the Project site. Therefore, no significant impacts would occur during construction activities.

The operational phase of the proposed Project would occur after construction is completed and residents move in to occupy the residential structures. The proposed Project will include land uses that are considered compatible with the surrounding uses. None of these land uses routinely transport, use, or dispose of hazardous materials, or present a reasonably foreseeable release of hazardous materials, with the exception of common residential grade hazardous materials such as household and commercial cleaners, paint, etc. The proposed Project would not create a significant hazard through the routine transport, use, or disposal of hazardous materials, nor would a significant hazard to the public or to the environment through the reasonably foreseeable upset and accidental conditions involving the likely release of hazardous materials into the environment occur. Therefore, the proposed Project will not create a significant hazard to the public or the environment and any impacts would be ***less than significant***.

Mitigation Measures: None are required.

c) 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 Impact. There are no schools located within the 0.25-mile radius of the proposed Project site. The closest schools are Dinuba High School to the east and Lincoln Elementary School to the northeast, which are both approximately 0.7 miles away from the Project site. As the proposed Project includes the development of family residences, it is not reasonably foreseeable that the proposed Project will cause a significant impact by emitting hazardous waste or bringing hazardous materials within one-quarter mile of an existing or proposed school. Residential land uses do not generate, store, or dispose of significant quantities of hazardous materials. Community commercial activities also do not normally involve dangerous activities that could expose persons onsite or in the surrounding areas to large quantities of hazardous materials. See also Responses *a.* and *b.* above regarding hazardous material handling. There would be a ***less than significant impact.***

Mitigation Measures: None are required.

d) 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?

No Impact. The Geotracker and Envirostor database searches were conducted to identify recorded hazardous materials incidents in the Project area. The search included cleanup sites under Federal Superfund (National Priorities List), State Response, and other federal, state, and local agency lists. The proposed Project site is not located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Geotracker[6] and Envirostor[7] databases). There is ***no impact.***

Mitigation Measures: None are required.

e) 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?

Less Than Significant Impact. There are no private or public airstrips in the Project vicinity. The Sequoia Field Airport is located approximately 9.3 miles to the southeast of the proposed Project site. Thus, any impacts are ***less than significant***.

Mitigation Measures: None are required.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less than Significant Impact. The Project has been designed for adequate emergency access and has been reviewed by the City. The internal roadways will be designed with sufficient clearances for emergency vehicles to access the entire site. Therefore, the Project will not impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. Any impacts are ***less than significant***.

Mitigation Measures: None are required.

g) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

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[6] Geotracker Database, California State Water Resources Control Board. https://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=dinuba. Accessed June 2024.

[7] EnviroStor Database, California Department of Toxic Control Substances. https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=dinuba. Accessed June 2024.

No Impact. The site is within the City of Dinuba and is completely surrounded by developed urban uses. The site is currently vacant and is routinely disked for weed control. There are no wildlands on or near the Project site. There is ***no impact***.

Mitigation Measures: None are required.

X. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐
b. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c. 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:	☐	☐	☒	☐
i. Result in substantial erosion or siltation on- or off- site;	☐	☐	☒	☐
ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii. 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	☐	☐	☒	☐
iv. impede or redirect flood flows?	☐	☐	☒	☐

X. HYDROLOGY AND WATER QUALITY **Would the project:**	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The City of Dinuba is located in the Tulare Lake hydrologic region, specifically within the Kings Sub-basin of the San Joaquin Valley groundwater basin.[8] The Kings Subbasin encompasses approximately 1,530 square miles within Fresno, Tulare and Kings counties. The Kings Subbasin is designated as a critically over-drafted high priority basin by the Department of Water Resources. The existence of overdraft in the Kings Subbasin is documented by historical decline in ground water levels and is confirmed by the historical water budgets presented by the Kings River East Groundwater Sustainability Agency and the Alta Irrigation District.[9] Dinuba has a groundwater depth of approximately 50 feet below the surface.

RESPONSES

a) <u>Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?</u>

Less Than Significant Impact. The proposed Project site is currently vacant. Grading, excavation and loading activities associated with construction activities could temporarily increase runoff, erosion, and

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[8] City of Dinuba, General Plan Update Draft Environmental Impact Report, December 2006. Page 3 – 74.

[9] City of Dinuba 2020 Urban Water Management Plan. December 2021. https://dinuba.org/images/docs/forms/Urban-Water-Management-Plan.pdf. Accessed June 2024.

sedimentation. Construction activities also could result in soil compaction and wind erosion effects that could adversely affect soils and reduce the revegetation potential at construction sites and staging areas.

Three general sources of potential short-term construction-related stormwater pollution associated with the proposed project are: 1) the handling, storage, and disposal of construction materials containing pollutants; 2) the maintenance and operation of construction equipment; and 3) earth moving activities which, when not controlled, may generate soil erosion and transportation, via storm runoff or mechanical equipment. Generally, routine safety precautions for handling and storing construction materials may effectively mitigate the potential pollution of stormwater by these materials. These same types of common sense, "good housekeeping" procedures can be extended to non-hazardous stormwater pollutants such as sawdust and other solid wastes.

Poorly maintained vehicles and heavy equipment leaking fuel, oil, antifreeze, or other fluids on the construction site are also common sources of stormwater pollution and soil contamination. In addition, grading activities can greatly increase erosion processes. Two general strategies are recommended to prevent construction silt from entering local storm drains. First, erosion control procedures should be implemented for those areas that must be exposed. Secondly, the area should be secured to control offsite migration of pollutants. These Best Management Practices (BMPs) would be required in theStormwater Pollution Prevention Plan (SWPPP) to be prepared prior to commencement of Project construction. When properly designed and implemented, these "good-housekeeping" practices are expected to reduce short-term construction-related impacts to less than significant.

In accordance with the National Pollution Discharge Elimination System (NPDES) Stormwater Program, the Project will be required to comply with existing regulatory requirements to prepare a SWPPP designed to control erosion and the loss of topsoil to the extent practicable using BMPs that the Regional Water Quality Control Board (RWQCB) has deemed effective in controlling erosion, sedimentation, runoff during construction activities. The specific controls are subject to review and approval by the RWQCB and are an existing regulatory requirement.

The City of Dinuba will provide water to the Project site and the Project will be required to tie into the City's existing water service infrastructure, upon approval of the General Plan Amendment, zone change and site plan review. The Project will comply with all City ordinances and standards to assure proper grading and drainage. Compliance with all local, state, and federal regulations will prevent violation of water quality standards or waste discharge requirements. The Project will be required to prepare a grading and drainage plan for review and approval by the City Engineer, prior to issuance of building permits. Therefore, any impacts will be ***less than significant***.

Mitigation Measures: None are required.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less Than Significant Impact. Project implementation will result in an increased demand for water. The City of Dinuba relies on groundwater as its sole water supply source. The City currently operates eight drinking water wells that are located throughout the PWS service area. In addition to the groundwater wells, the City maintains two elevated storage tanks with a capacity of 1.25 million gallons and the 2.0 MG Northeast Water Reservoir, a ground level tank and booster pump station.[10]

The City of Dinuba is part of the Kings River East Groundwater Sustainability Agency (KREGSA) which prepared a Groundwater Sustainability Plan (GSP) of which the City of Dinuba is a participant. The City adopted its latest Urban Water Management Plan (UWMP) in December 2021. The UWMP states that with implementation of the projects and management actions identified in the KREGSA GSP, the City's groundwater supplies are anticipated to be sustainable and available to meet the projected demands of its Public Water System service area.[11]

The site is currently designated for urban uses in the General Plan and as such, water use at the site has been accounted for in the City's planning documents. Project demands for groundwater resources would not substantially deplete groundwater supplies and/or otherwise interfere with groundwater recharge efforts being implemented by the City of Dinuba. Future demand can be met with continued groundwater pumping and conservation measures. Additionally, compliance with existing State regulations will ensure that impacts to groundwater supply will be ***less than significant.***

Mitigation Measures: None are required.

c) 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:

   i. result in substantial erosion or siltation on- or offsite;

[10] City of Dinuba 2020 Urban Water Management Plan, December 2021. Pg 6-1.

[11] Ibid.

ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

iii. 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

iv. impede or redirect flood flows?

Less Than Significant Impact. Lands surrounding the proposed Project are Dinuba Town Ditch, a portion of San Joaquin Valley Railroad, and commercial businesses to the north; Surabian Drive, agricultural row crops and a large distribution center (Ruiz Foods) to the south; Holiday Inn and ARCO Fuel Station to the east; and vacant land and a Walmart Supercenter/ parking lot to the west.

The proposed Project will change drainage patterns of the site through the installation of impervious surfaces and structures (houses, driveways, streets, etc.) and will be required by the City to be graded to facilitate proper stormwater drainage into the stormwater basin included with the Project. Storm water during construction will be managed as part of the Storm Water Pollution Prevention Plan (SWPPP). A copy of the SWPPP will be retained on-site during construction.

The proposed Project site is located outside of any Flood Zone or Special Flood Hazard Areas, as indicated by FEMA flood hazard map 06107C0317E, effective 6/16/2009. The proposed development will be built in accordance with the current City ordinances and California Building Code regarding construction outside of flood zones. The Project will be designed for adequate storm drainage. Accordingly, the chance of flooding (and therefore the release of pollutants due to flooding) at the site is remote. Impacts are ***less than significant.***

Mitigation Measures: None are required.

d) In flood hazard, tsunami or seiche zones, risk release of pollutants due to project inundation?

Less Than Significant Impact. As discussed in Impact X(c), the proposed Project site is located outside of any Flood Zone or Special Flood Hazard Areas. The Project includes development of adequate storm drainage. The proposed development will be required to prepare and submit a water quality control plan to be implemented during construction, as required by the National Pollutant Discharge Elimination System. This plan will be reviewed and approved by the City Engineer prior to the start of construction.

There are no inland water bodies that could be potentially susceptible to a seiche in the Project vicinity. This precludes the possibility of a seiche inundating the Project site. The Project site is more than 100 miles from the Pacific Ocean, a condition that precludes the possibility of inundation by tsunami. There are no steep slopes that would be susceptible to a mudflow in the Project vicinity, nor are there any volcanically active features that could produce a mudflow in the City of Dinuba. This precludes the possibility of a mudflow inundating the Project site. Any impacts are ***less than significant***.

Mitigation Measures: None are required.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact. The Project will not conflict with any water quality control plans or sustainable groundwater management plan. However, as mentioned in Section c., all new development within the City of Dinuba Planning Area must conform to standards and plans contained in the Dinuba Stormwater Drainage Master Plan. By conforming to all standards and policies as outlined, there will be ***no impacts*** associated with the Project.

Mitigation Measures: None are required.

XI. LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Physically divide an established community?	☐	☐	☒	☐
b. 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?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The proposed Project site is in western Dinuba. The City of Dinuba lies in the Central San Joaquin Valley region, in the northwestern portion of Tulare County. The City is approximately eight miles northeast of State Route (SR) 99 and 5.5 miles west of SR 63.

RESPONSES

a) <u>Physically divide an established community?</u>

b) <u>Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the General Plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?</u>

Less Than Significant Impact. The proposed Project includes development of 126 apartment units on an approximately 5.75-acre site. The site is currently within the western City limits of Dinuba. Entitlements needed to accommodate the proposed Project include a General Plan Amendment, Zone Change, and a site plan review.

Surrounding the proposed Project are Dinuba Town Ditch, a portion of San Joaquin Valley Railroad, and commercial businesses to the north; Surabian Drive, agricultural row crops and a large distribution center (Ruiz Foods) to the south; Holiday Inn and ARCO Fuel Station to the east; and vacant land and a Walmart Supercenter/ parking lot to the west. The Project applicant proposes a Zone Change from M-1 (Light Industrial) to RM-1.5 (Residential, High Density) and a General Plan Amendment converting

Light Industrial to High Density Residential. Upon approval, these proposed changes will not conflict with any applicable land use plans, policies or regulations. The Project will comply with the City of Dinuba's General Plan.

The Project would provide housing opportunities to the residents of Dinuba and improve access to existing surrounding areas. The proposed development has no characteristics that would physically divide the City of Dinuba. Any impacts will be ***less than significant impact.***

Mitigation Measures: None are required.

XII. MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. 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?	☐	☐	☐	☒
b. 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?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Tulare County commercially extracts important minerals such as sand, gravel, crushed rock and natural gas.[12] Other minerals have been mined in the county to a smaller extent, including tungsten, chromite, copper, gold, lead, manganese, silver, zinc, barite, feldspar, limestone and silica. Aggregate resources are considered the County's most valuable extractive mineral.

RESPONSES

a) 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?

b) 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?

No Impact. There are no known mineral resources in the proposed Project area and the site is not included in a State-classified mineral resource zones. No mineral resource locations are within the vicinity of the City of Dinuba.[13] Therefore, there is ***no impact***.

Mitigation Measures: None are required.

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[12] Tulare County General Plan Background Report, February 2010. Page 10-17.

[13] City of Dinuba General Plan Update Background Report, October 2006. Page 9-12.

XIII. NOISE

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Generation of a substantial temporary or permanent increase in 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?	☐	☐	☒	☐
b. Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c. 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, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Noise is often described as unwanted sound. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. The City of Dinuba is impacted by a multitude of noise sources. Principal noise sources include traffic on roadways, agricultural noise and industrial noise. Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities, and they are predominant sources of noise in the City. The Project site is located in an area with a mix of uses. The predominant noise sources in the Project area include traffic on local roadways, residential noise (lawn mowers, audio equipment, voices, etc.), commercial activity noise, and potential noise from the nearby agricultural land uses.

RESPONSES

a) Generation of a substantial temporary or permanent increase in 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?

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less Than Significant Impact.

Short-term (Construction) Noise Impacts

Proposed Project construction related activities will involve temporary noise sources. Typical construction related equipment include graders, trenchers, small tractors and excavators. During the proposed Project construction, noise from construction related activities will contribute to the noise environment in the immediate vicinity. Table 5 indicates the anticipated noise levels of the typical construction-related equipment (i.e., graders, trenchers, tractors) based on a distance of 50-feet between the equipment and the sensitive noise receptor.[14]

Table 5
Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) 50 ft from Source
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Dozer	85
Generator	82
Grader	85
Jack Hammer	88
Loader	85
Paver	85
Truck	84

[14] The Noise and Vibration Impact Assessment Manual, Federal Transit Administration, U.S. Department of Transportation. September 2018. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Table 7-1. Accessed June 2024.

The distinction between short-term construction noise impacts and long-term operational noise impacts is a typical one in both CEQA documents and local noise ordinances, which generally recognize the reality that short-term noise from construction is inevitable and cannot be mitigated beyond a certain level. Thus, local agencies frequently tolerate short-term noise at levels that they would not accept for permanent noise sources. A more severe approach would be impractical and might preclude the kind of construction activities that are to be expected from time to time in urban environments. Most residents of urban areas recognize this reality and expect to hear construction activities on occasion.

Long-term (Operational) Noise Impacts

The primary source of on-going noise generated by the Project will be from vehicles traveling on internal access roads and from traffic traveling along Surabian Drive. Project implementation will result in an increase in traffic on some roadways in the Project area. However, the relatively low number of new trips associated with the Project is not likely to increase the ambient noise levels by a significant amount. The area is active with vehicles, residential housing, commercial, and agricultural land uses, so the proposed Project will not introduce a new significant source of noise that isn’t already occurring in the area.

Vibration Levels

Typical outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Construction vibrations can be transient, random, or continuous. Construction associated with the proposed Project includes construction of 126 apartments and the associated improvements, including but not limited to a community center, pool and playground. The site construction will also include internal access roads, street lighting, site landscaping and additional related improvements.

The approximate threshold of vibration perception is 65 VdB, while 85 VdB is the vibration acceptable only if there are an infrequent number of events per day. Table 6 describes the typical construction equipment vibration levels.[15]

[15] Ibid.

Table 6
Typical Construction Vibration Levels

Equipment	VdB at 25 ft
Small Bulldozer	58
Jackhammer	79

Vibration from construction activities will be temporary and not exceed the Federal Transit Administration (FTA) threshold for the nearest rural residences, which are located north of W. El Monte Way and east of S. Alta Avenue.

Therefore, the impact is considered ***less than significant.***

Mitigation Measures: None are required.

c) 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, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. The Project is not located within an airport land use plan, and the City of Dinuba does not contain any airport or airstrip. Therefore, there is ***no impact***.

Mitigation Measures: None are required.

XIV. POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Induce substantial 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)?	☐	☐	☒	☐
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

Dinuba's population has exhibited major growth since 2000. The population in 2000 was 16,844[16], while the population as of January 2023 was 25,469.[17] This represents an approximate increase of 51.2%. Estimates for 2023 shows that the City has 7,170 housing units with an average of 3.58 people per household.[18]

RESPONSES

a) <u>Induce substantial 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)?</u>

b) <u>Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?</u>

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[16] City of Dinuba General Plan Update Background Report, October 2006. Page 4-1.

[17] E-5 Population and Housing Estimates for Cities, Counties, and the State, 2020-2024. California Department of Finance, January 2024. https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2024/. Accessed June 2024.

[18] Ibid.

Less Than Significant Impacts. There will be 126 new homes associated with the proposed Project and the site is currently vacant. Based on data regarding persons per dwelling, the site would provide additional housing for approximately 451 people. This is a relatively small population and is not expected to affect any regional population, housing or employment projections anticipated by City documents.

The site is currently inside the western City limits of Dinuba. As such, the increase in population has been planned for. Entitlements needed to accommodate the proposed Project include General Plan Amendment, Zone Change, and a site plan review. The City of Dinuba's primary industry is agriculture, but there is sufficient labor force in the area to support many other types of industries. The proposed Project will alleviate some overcrowding in the regional population by contributing reliable housing, and will additionally provide temporary construction jobs to the local workforce. In conclusion, the Project implementation will not displace substantial numbers of people and instead provide needed housing. Any impacts are considered ***less than significant***.

Mitigation Measures: None are required.

XV. PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Would the project 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?	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The Dinuba Fire Department is located at 496 East Tulare Street, Dinuba, approximately 0.6 miles east of the Project site. The Dinuba Fire Department offers a full range of services including fire/rescue, emergency medical treatment and transport, fire prevention, and hazardous materials first response.

Police protection services are provided by the Dinuba Police Department, which is approximately 0.3 miles southeast of the Project site at 680 South Alta Avenue, Dinuba. The Dinuba Police Department provides a full range of police services.

Educational services are provided by the Dinuba Unified School District (DUSD). Dinuba Unified School District operates eleven schools within the planning area; six elementary schools, one middle school, one traditional high school, one continuing education school, one independent study school, and one adult education school.

RESPONSES

a) Would the project 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?

Less Than Significant Impact.

The proposed Project would be required to comply with all applicable fire and building safety codes (California Building Code and Uniform Fire Code) to ensure fire safety elements are incorporated into final Project design, including the providing designated fire lanes marked as such. Proposed interior streets will be required to provide appropriate widths and turning radii to safely accommodate emergency response and the transport of emergency/public safety vehicles. The proposed Project will also be designed to meet Fire Department requirements regarding water flow, water storage requirements, hydrant spacing, infrastructure sizing, and emergency access. As a result, appropriate fire safety considerations will be included as part of the final design of the Project. The proposed Project at full buildout will add to the number of "customers" served, however, the Fire Department has capacity for the additional service need. No additional fire equipment, personnel, or services are anticipated to be required by Project implementation. In addition, the Project applicant will be required to pay all associated impact fees related to public services. As such, any impacts are ***less than significant***.

Police Protection?

Less Than Significant Impact. Implementation of the proposed Project would result in an increase in demand for police services; however, this increase would be minimal compared to the number of officers currently employed by the Dinuba Police Department and would not trigger the need for new or physically altered police facilities. No additional police personnel or equipment is anticipated. In addition, each home will be assessed a public safety impact fee by the City that is used to make capital improvements for the Police Department. Impacts are ***less than significant.***

Schools?

Less Than Significant Impact. Since the proposed Project includes the addition of approximately 126 residential units, the number of students in the school district will increase. New development projects are required by state law to pay development impact fees to the school districts at the time of building permit issuance. These impact fees are used by the school districts to maintain existing and develop new facilities, as needed.

While development of the 126 residential units alone is not expected to require the alteration of existing or construction of new school facilities, the development will contribute to the cumulative need for increased school facilities. The timing of when new school facilities would be required or details about size and location cannot be known until such facilities are planned and proposed, and any attempt to analyze impacts to a potential future facility would be speculative. As the future new school facilities are further planned and developed, they would be subject to their own separate CEQA environmental review in order to identify and mitigate any potential environmental impacts. Therefore, the impact is ***less than significant.***

<u>Parks?</u>

Less Than Significant Impact. The closest park to the proposed Project is the Felix Delgado Park located approximately 0.7 miles southeast and the Rose Ann Vuich Park located approximately 0.7 miles northeast. The Project will be required to pay City Park facility impact fees to compensate for any service demand increase on existing parks within the Dinuba area. The Project applicant would be required to comply with the Municipal Code and Ordinances. Impacts are ***less than significant.***

<u>Other public facilities?</u>

Less Than Significant Impact. The proposed Project is within the land use and growth projections identified in the City's General Plan and other infrastructure studies. The Project, therefore, would not result in increased demand for, or impacts on, other public facilities such as library services. Any impacts will be ***less than significant***.

Mitigation Measures: None are required.

XVI. RECREATION

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Would the project increase 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?	☐	☐	☒	☐
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

There are twelve parks within the City of Dinuba; Alice Park, Centennial Park, Felix Delgado Park, Gregory Park, K/C Vista Park, Nebraska Park, Pamela Park/Basin, Rose Ann Vuich Park, Roosevelt Park/Dinuba Community Center, Entertainment Plaza, Peachwood Park and Ponding Basin, and Rotary Park. These parks are managed by the City of Dinuba's Parks and Community Services Department. This department also supervises and coordinates a wide variety of community programs and activities.

RESPONSES

a) <u>Would the project increase 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?</u>

b) <u>Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?</u>

Less Than Significant Impact. The Project Applicant intends to develop 126 apartment units on an approximately 5.75-acre site. The site is currently inside the western City limits of Dinuba. To accommodate this Project, the City will need to approve an General Plan Amendment, Zone Change, and site plan review. However, the increase of approximately 451 persons resulting from the Project would have a relatively small impact on existing recreational facilities. In order to implement the goals and objectives of the City's General Plan, and to mitigate the impacts caused by future development in the City, park facilities must be constructed. The City Council has determined that a Park Facilities Impact Fee is warranted in order to finance these public facilities and to pay for each development's fair share of the construction and acquisition costs. The Project Applicant will be required to pay development impact fees as determined by the City of Dinuba's Park Facilities Fees. Therefore, impacts are considered ***less than significant impacts***.

Mitigation Measures: None are required.

XVII. TRANSPORTATION/TRAFFIC **Would the project:**	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☒	☐	☐
b. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☒	☐	☐
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d. Result in inadequate emergency access?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The proposed Project site consists of a vacant agricultural field disked regularly for weed control.

A Traffic Study (Appendix C) was prepared for the Project by Ruettgers & Schuler Civil Engineers on June 2024 and is the basis of analysis for the following transportation analysis.

The purpose of the Traffic Study is to evaluate the potential impacts of a proposed residential development located south of El Monte Way, north of Surabian Way, on the west side of Alta Avenue in Dinuba, CA. The study included both level of service (LOS) and vehicle miles traveled (VMT) analyses.

RESPONSES

a) <u>Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?</u>

b) <u>Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?</u>

Less Significant Impact with Mitigation Incorporation. A total of four intersections are directly related to or adjacent to the proposed Project and are included in the study: three signalized and one stop controlled.

Project Trip Generation and Design Hour Volumes

The trip generation and design hour volumes for the residential development were calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition. The ADT, AM and PM peak hour rate equations, and peak hour directional splits for the ITE Land Use Code 220 (Multi-Family Housing) were used to estimate the Project traffic. See Table 7.

Table 7 – Project Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
220	Multifamily Housing (Low Rise)	126 Dwelling Units	eq	883	eq	24% 15	76% 47	eq	63% 47	37% 28

Trip Distribution and Assignment

The project trip distribution in Table 8 represents the most likely travel routes for traffic accessing the project. Project traffic distribution was estimated based on a review of the potential draw from population centers within the region and the types of land uses involved.

Table 8 – Project Trip Distribution

Direction	Percent
North	35
East	25
South	25
West	15

Existing and Future Traffic

Weekday peak hour turning movements were counted at the following intersections in May 2024 (see Appendix C for count data). Traffic counts were conducted between the hours 6:00 to 8:00 AM and 4:00

to 6:00 PM and are shown in Figure 5 of Appendix C. Existing + Project peak hour volumes are shown in Figure 6 of Appendix C. Annual growth rates ranging between 1.77% and 4.79% were applied to existing traffic volumes to estimate future traffic volumes for the year 2044. These growth rates were estimated based on a review of existing and approved future developments in the vicinity of the project and TCAG traffic model data. Future peak hour volumes are shown in Figures 7 and 8 of Appendix C.

Results of Intersection Analysis

All four study intersections currently operate above LOS D during peak hours with and without project traffic in 2024. All intersections are anticipated to continue to operate above LOS D in 2044 prior to, and with the addition of project traffic. Therefore, no improvements are recommended.

Results of Traffic Signal Warrant Analysis

The peak hour signal warrants were evaluated for the unsignalized intersection (Monte Vista Drive at Surabian Drive) within the study. The analysis indicated that the signal warrant thresholds were not met for any of the criteria tested for the Project.

Results of Level of Service Analysis

The City of Dinuba Circulation Element states that the peak hour level of service for roadways shall be no lower than LOS C for urban areas. It should be noted that LOS D is allowed if a roadway segment is currently operating at an LOS D prior to the addition of the project traffic in the existing scenario.

All roadway segments within the scope of the study currently operate above LOS C during peak hours prior to, and with the addition of project traffic in 2024. All roadway segments are anticipated to continue to operate at LOS C in 2044 prior to, and with the addition of project traffic. Therefore, no improvements are recommended.

Results of VMT Analysis

An evaluation of vehicle miles traveled (VMT) for project traffic was conducted in accordance with California Environmental Quality Act (CEQA) requirements. The City of Dinuba has adopted the "County of Tulare SB 743 Guidelines", dated June 8, 2020, which contains recommendations regarding VMT assessment, significance thresholds and mitigation measures.

Baseline VMT was determined utilizing data from the California Statewide Travel Demand Model (CSTDM). The proposed residential project is located in Traffic Analysis Zone (TAZ) 2777, which has an average VMT/capita of 10.70 miles. The proposed residential Project is considered a typical project within the TAZ and therefore the Project would be expected to have the same VMT per capita. There are no special considerations with the Project to assume the Project would produce a VMT/capita lower than the average for the TAZ. The threshold of significance for residential project VMT/capita is if the project VMT is below the average in the TAZ where the project is located. Since VMT/capita is assumed to be equal to the average for the aforementioned zone, it is anticipated that the proposed Project will have a significant transportation impact prior to mitigation.

The Tulare County guidelines include detailed instructions for mitigation if a project has significant impacts. The guidelines state "The preferred method of VMT mitigation in Tulare County is for project applicants to provide transportation improvements that facilitate travel by walking, bicycling, or transit." In accordance with these guidelines, a survey was conducted within a half mile of the project to determine whether any pedestrian, bicycle or transit facilities deficiencies exist. After review, sidewalks and ADA compliant wheelchair ramps are proposed to be constructed. The identified improvements include the following and are shown in Figure 9 of the Traffic Study:

- 110 feet of sidewalk between Dickey Avenue & Smith Avenue on the north side of El Monte Way.
- 180 feet of sidewalk on the east side of Dickey Avenue on the north side of El Monte Way.
- Two (2) ADA compliant curb ramps at Smith Avenue and El Monte Way.

The guidelines include a minimum cost for mitigation of $20 per daily trip generated by the project or 0.5% of the total construction cost of the project (not including land acquisition). As shown in Table 7, the Project is anticipated to generate 883 daily trips, which equates to a target value of improvements of $17,660. The total mitigation cost, for the identified improvements, is estimated at approximately $18,162 with a 20% contingency. Pursuant to the guidelines, if a project provides mitigation which meets the minimum target listed above, the project can presume a 1% reduction in VMT. The assumed VMT/capita reduction is 1% of 10.70 or 0.107. The resulting VMT/capita after mitigation is 10.59 which is below the average VMT/capita in the TAZ which the Project is located.

With implementation of Mitigation Measure TRA-1, the Project will have a *less than significant transportation impact*.

Mitigation Measures:

TRA- 1: The Project Applicant shall install the following improvements prior to the City's issuance of the first Permit of Occupancy.

• 110 feet of sidewalk between Dickey Avenue & Smith Avenue on the north side of El Monte Way, per City Standards.

• 180 feet of sidewalk on the east side of Dickey Avenue on the north side of El Monte Way, per City Standards.

• Two (2) ADA compliant curb ramps at Smith Avenue and El Monte Way, per City Standards.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less Than Significant Impact. The proposed Project has been designed for ease of access, adequate circulation/movement, and is typical of residential developments in the City of Dinuba. On-site circulation patterns do not involve high speeds, sharp curves or dangerous intersections. Although there will be an increase in the volume of vehicles accessing the site and surrounding areas, the proposed Project will not present a substantial increase in hazards. Any impacts are considered ***less than significant.***

Mitigation Measures: None are required.

d) Result in inadequate emergency access?

Less Than Significant Impact. The proposed Project does not involve a change to any emergency response plan. As currently planned, access to the proposed residential development would be provided along Surabian Way. The site will remain accessible to emergency vehicles of all sizes. As such, potential impacts are ***less than significant.***

Mitigation Measures: None are required.

XVIII. TRIBAL CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. 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:				
i. 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	☐	☐	☒	☐
ii. 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 the Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

RESPONSES

a) Would the project 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:

i) 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

ii) 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 Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less Than Significant Impact. In accordance with Assembly Bill (AB) 52 and Senate Bill (SB) 18, potentially affected Tribes were formally notified of this Project and were given the opportunity to request consultation on the Project. The City contacted the Native American Heritage Commission, requesting a contact list of applicable Native American Tribes, which was provided to the City. On April 7, 2024, the City provided letters to the tribes below notifying them of the Project and requesting consultation, if desired.

- Big Sandy Rancheria of Western Mono Indians
- North Fork Mono Tribe
- Santa Rosa Rancheria Tachi Yokut Tribe
- Tule River Indian Tribe
- Wuksache Indian Tribe/Eshom Valley Band

The City did not receive any responses from the tribes contacted. Therefore, there is a ***less than significant impact***.

Mitigation Measures: None are required.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c. 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?	☐	☐	☒	☐
d. 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?	☐	☐	☒	☐
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The proposed Project will be required to connect to water, sewer, stormwater and wastewater services provided by the City of Dinuba and may be subject to water use fees and/or development fees to be provided such service. In addition, the Project will require solid waste disposal services.

RESPONSES

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less than Significant Impact. The Project site is located within the service territory of the City of Dinuba and is currently designated for urban development in the City of Dinuba General Plan. Operational discharge flows treated at the City's wastewater treatment facility would be required to comply with applicable water discharge requirements issued by the Central Valley Regional Water Quality Control Board (RWQCB). Compliance with conditions or permit requirements established by the City as well as water discharge requirements outlined by the Central Valley RWQCB would ensure that wastewater discharges coming from the proposed Project site and treated by the WWTF system would not exceed applicable Central Valley RWQCB wastewater treatment requirements.

As discussed in Section X, Hydrology and Water Quality, with an increase in the area of impervious surfaces on the Project site, an increase in the amount of storm water runoff is anticipated. The site will be designed so that storm water is collected and deposited in the City's existing storm drain system. The storm water collection system design will be subject to review and approval by the City Public Works Department. Storm water during construction will be managed as part of the Storm Water Pollution Prevention Plan (SWPPP). A copy of the SWPPP is retained on-site during construction. Thus, the proposed Project would have a ***less than significant impact.***

Mitigation Measures: None are required.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less Than Significant Impact. Water service would be provided to the Project by the City of Dinuba. The City of Dinuba relies on groundwater as its sole water supply source. The system has a capacity of approximately 11 million gallons per day (7,600 GPM), and average daily demand is 4.2 million gallons per day (or 2,900 GPM).[19] According to the City's 2020 Urban Water Management Plan, the City currently operates eight drinking water wells that are located throughout the PWS service area. In addition to the groundwater wells, the City maintains two elevated storage tanks with a capacity of 1.25 million gallons and the 2.0 MG Northeast Water Reservoir, a ground level tank and booster pump station in the northeast section of the City.[20] The City is a member of the Kings River East Groundwater Sustainability Agency (KREGSA). The City's main water supply comes from eight active underground water wells distributed throughout the City. The water is treated and delivered to the community by the City of Dinuba water system. The most recent KREGSA GSP Annual Report indicates that groundwater levels at Representative Monitoring Sites near the City are above their designated Minimum Thresholds and on track to meet the forecast groundwater level projections and Interim Milestones established for these wells.[21]

The City anticipates that its sources of supplies will be available to meet demands on a consistent basis for all year types throughout the planning horizon of the UWMP, as the site is within the adopted Sphere of Influence and has been included in the City's infrastructure planning documentation. The proposed development will be required to follow the City's General Plan and Zoning Ordinances which include land use goals, policies, and implementation measures for developments regarding water use. The Project developer will also be required to pay the City of Dinuba's water system impact fees. Funds accrued under this fee are used to make capital improvements to the City's water system, including conservation improvements. Impacts are ***less than significant impact.***

Mitigation Measures: None are required.

c) 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 Impact. The proposed Project will result in wastewater from residential units that will be discharged into the City's existing wastewater treatment system. The wastewater will be typical of other residential developments consisting of bathrooms, kitchen drains, and other similar features. The Project will not discharge any unusual or atypical wastewater that would violate the City's waste discharge requirements. Therefore, assuming compliance with applicable standards and payment of required impact fees and connection charges, the Project would not result in a significant impact related

[19] City of Dinuba 2015-2023 Housing Element. Pg 6-9. Accessed January 2024.

[20] City of Dinuba 2020 Urban Water Management Plan. Pg 6-1. Accessed January 2024.

[21] Ibid. Pg 1-3.

to construction or expansions of existing wastewater treatment facilities. The impact of the Project on wastewater treatment is ***less than significant***.

Mitigation Measures: None are required.

d) 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?

e) Comply with federal, state, and local statutes and regulations related to solid waste?

Less Than Significant Impact. The City of Dinuba, through a private contractor, provides weekly curbside solid waste collection services to all households, businesses, and industries within City limits. Solid waste is taken to the Visalia Landfill, which is operated by Tulare County.[22] Furthermore, the proposed Project would be required to comply with all standards related to solid waste diversion, reduction, and recycling during Project construction and operation. The Project is not expected to generate an excess of solid waste beyond what is considered typical of residential land uses. The proposed Project will comply with all federal, state and local statutes and regulations related to solid waste. As such, any impacts would be ***less than significant.***

Mitigation Measures: None are required.

[22] Solid Waste, Tulare County. https://tularecounty.ca.gov/solidWaste/landfills/locations-fees/visalia-landfill/. Accessed June 2024.

XX. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b. 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?	☐	☐	☒	☐
c. 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?	☐	☐	☒	☐
d. 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?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The City of Dinuba's planning area is composed of urbanized portions of land and the surrounding agricultural fields. The Project site has ensured fire protection by the Dinuba Fire Department, located at 496 East Tulare Street approximately 0.6 miles east of the site. Given the location of the nearest fire station, response time is expected to be extremely quick in the rare event of a fire event.

The proposed Project site's elevation is approximately 339 feet above sea level in an area of intense urban and agricultural development. Surrounding the proposed Project are Dinuba Town Ditch, a portion of San Joaquin Valley Railroad, and commercial businesses to the north; Surabian Drive, agricultural row crops and a large distribution center (Ruiz Foods) to the south; Holiday Inn and ARCO Fuel Station to the east; and vacant land and a Walmart Supercenter/ parking lot to the west.

RESPONSES

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

b) 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?

c) 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?

d) 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 Impact. The proposed Project is located in an area developed with residential, commercial, and agricultural uses, which precludes the risk of wildfire. The area is flat in nature which would limit the risk of downslope flooding and landslides, and limit any wildfire spread. The proposed Project does not require the installation or maintenance of associated infrastructure that would increase wildfire risk or result in impacts to the environment. To receive building permits, the proposed Project would be required to be in compliance with the adopted emergency response plan. As such, any wildfire risk to the project structures or people would be ***less than significant.***

Mitigation Measures: None are required.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

RESPONSES

a) <u>Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of</u>

a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant Impact With Mitigation. The analyses of environmental issues contained in this Initial Study indicate that the proposed Project is not expected to have a substantial impact on the environment or on any resources identified in the Initial Study. Mitigation measures have been incorporated in the Project to reduce all potentially significant impacts to ***less than significant***.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Less Than Significant Impact. CEQA Guidelines Section 15064(i) states that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. Due to the nature of the Project and consistency with environmental policies, incremental contributions to impacts are considered less than cumulatively considerable. The proposed Project would not contribute substantially to adverse cumulative conditions, or create any substantial indirect impacts (i.e., increase in population could lead to an increased need for housing, increase in traffic, air pollutants, etc.). The impact is ***less than significant***.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant Impact With Mitigation. The analyses of environmental issues contained in this Initial Study indicate that the Project is not expected to have substantial impact on human beings, either directly or indirectly. Mitigation measures have been incorporated in the Project to reduce all potentially significant impacts to ***less than significant***.

LIST OF PREPARERS

Crawford & Bowen Planning, Inc.

- Emily Bowen, LEED AP, Principal Environmental Planner
- Travis Crawford, AICP, Principal Environmental Planner
- Caroline Gibbons, Assistant Planner

LSA Consulting Services

- Jessica Coria, Associate
- Bianca Martinez, Air Quality Specialist

Ruettgers & Schuler Civil Engineers

- Ian J. Parks, RCE

Persons and Agencies Consulted

City of Dinuba

- Karl Schoettler, Contract City Planner

Southern San Joaquin Valley Information Center

- Jeremy E. David, Assistant Coordinator

MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) has been formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) for the City of Dinuba's Verma Apartments Project (proposed Project). The MMRP lists mitigation measures recommended in the IS/MND for the proposed Project and identifies monitoring and reporting requirements as well as conditions recommended by responsible agencies who commented on the project.

The first column of the Table identifies the mitigation measure. The second column, entitled "Party Responsible for Implementing Mitigation," names the party responsible for carrying out the required action. The third column, "Implementation Timing," identifies the time the mitigation measure should be initiated. The fourth column, "Party Responsible for Monitoring," names the party ultimately responsible for ensuring that the mitigation measure is implemented. The last column will be used by the City to ensure that individual mitigation measures have been monitored.

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
<u>Air Quality Protection Measures</u> **AIR-1:** Consistent with San Joaquin Valley Air Pollution Control District (SJVAPCD) Regulation VIII (Fugitive PM10 Prohibitions), the following controls shall be required to be included as specifications for the proposed Project and implemented at the construction site: • All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant or covered with a tarp or other suitable cover or vegetative ground cover. • All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant. • All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking. • When materials are transported off site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container shall be maintained. • All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry	Project Applicant	Prior to and during construction	Project Applicant / City of Dinuba	

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.) • Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/ suppressant.				
<u>Protect Nesting Birds</u> **BIO-1:** To the extent practicable, construction shall be scheduled to avoid the nesting season, which extends from February through August. If it is not possible to schedule construction between September and January, pre-construction surveys for nesting birds shall be conducted by a qualified biologist to ensure that no active nests will be disturbed during the implementation of the Project. A pre-construction survey shall be conducted no more than 14 days prior to the initiation of construction activities. During this survey, the qualified biologist shall inspect all potential nest substrates in and immediately adjacent to the impact areas. If an active nest is found close enough to the construction area to be disturbed by these activities, the qualified biologist shall determine the extent of a construction-free buffer to be established around the nest. If work cannot proceed without disturbing the nesting birds, work may need to be halted or redirected to other areas until nesting and fledging are completed or the nest has otherwise failed for non-construction related reasons.	Project Applicant	Prior to and during construction	Project Applicant / City of Dinuba	

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
Cultural Resources Protection Measures **CUL-1:** Should evidence of prehistoric archeological resources be discovered during construction, the contractor shall halt all work within 25 feet of the find and the resource shall be evaluated by a qualified archaeologist. If evidence of any archaeological, cultural, and/or historical deposits is found, hand excavation and/or mechanical excavation shall proceed to evaluate the deposits for determination of significance as defined by the CEQA guidelines. The archaeologist shall submit reports, to the satisfaction of the City of Dinuba, describing the testing program and subsequent results. These reports shall identify any program mitigation that the project proponent shall complete in order to mitigate archaeological impacts (including resource recovery and/or avoidance testing and analysis, removal, reburial, and curation of archaeological resources). **CUL-2:** In order to ensure that the proposed project does not impact buried human remains during construction, the project proponent shall be responsible for on-going monitoring of project construction. Prior to the issuance of any grading permit, the project proponent shall provide the City of Dinuba with documentation identifying construction personnel that will be responsible for on-site monitoring. If buried human remains are encountered during construction, further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent	Project Applicant	Prior to and during construction	Project Applicant	

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
remains shall be halted until the Tulare County coroner is contacted and the coroner has made the determinations and notifications required pursuant to Health and Safety Code Section 7050.5. If the coroner determines that Health and Safety Code Section 7050.5(c) require that he give notice to the Native American Heritage Commission, then such notice shall be given within 24 hours, as required by Health and Safety Code Section 7050.5(c). In that event, the NAHC will conduct the notifications required by Public Resources Code Section 5097.98. Until the consultations described below have been completed, the landowner shall further ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices where Native American human remains are located, is not disturbed by further development activity until the landowner has discussed and conferred with the Most Likely Descendants on all reasonable options regarding the descendants' preferences and treatments, as prescribed by Public Resources Code Section 5097.98(b). The NAHC will mediate any disputes regarding treatment of remains in accordance with Public Resources Code Section 5097.94(k). The landowner shall be entitled to exercise rights established by Public Resources Code Section 5097.98(e) if any of the circumstances established by that provision become applicable.				

Mitigation Measure	Party responsible for Implementing Mitigation	Implementation Timing	Party responsible for Monitoring	Verification (name/date)
<u>Vehicle Miles Travelled Reduction Measures</u> **TRA-1:** The Project Applicant shall install the following improvements prior to the City's issuance of the first Permit of Occupancy. • 110 feet of sidewalk between Dickey Avenue & Smith Avenue on the north side of El Monte Way, per City Standards. • 180 feet of sidewalk on the east side of Dickey Avenue on the north side of El Monte Way, per City Standards. • Two (2) ADA compliant curb ramps at Smith Avenue and El Monte Way, per City Standards.	Project Applicant	Prior to issuance of first Permit of Occupancy	City of Dinuba	

Appendix A

Air Quality, Energy, and Greenhouse Gas Emissions Technical Memorandum

LSA

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: May 30, 2024

TO: Emily Bowen, Crawford & Bowen Planning, Inc.

FROM: Jessica Coria, Associate
Bianca Martinez, Air Quality Specialist

SUBJECT: Air Quality, Energy, and Greenhouse Gas Emissions Technical Memorandum for the Proposed Dinuba Apartments Project

INTRODUCTION

LSA has prepared this Air Quality, Energy, and Greenhouse Gas Emissions Technical Memorandum to evaluate the impacts associated with construction and operation of the proposed Dinuba Apartments Project (project) in Dinuba, Tulare County, California. This analysis was prepared using methods and assumptions recommended in the San Joaquin Valley Air Pollution Control District's (SJVAPCD) *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI).[1] This analysis includes a description of the existing regulatory framework, an assessment of project construction and operation period emissions, and an assessment of greenhouse gas (GHG) emissions and energy impacts resulting from the proposed project.

PROJECT DESCRIPTION

The 250,568-square-foot (sq ft) project site is located at Surabian Drive and South Alta Avenue in Dinuba. The project site is currently vacant and is surrounded by retail and commercial uses. Local access to the site is provided by Surabian Drive. Figure 1 shows the project location, and Figure 2 shows the project's site plan (Attachment A).

The proposed project would include the construction of a 126-unit multifamily residential development. The proposed project would include approximately 57,757 sq ft of landscape area and would provide 295 parking spaces. The proposed project would also comply with the 2022 California Green Building Standards Code (CALGreen Code) building measures and Title 24 standards for solar and electric vehicles (EV). In addition, the proposed project would be designed to be all electric. Based on the project's trip generation, the proposed project is estimated to generate 883 average daily trips[2].

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1 San Joaquin Valley Air Pollution Control District (SJVAPCD). 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19. Website: www.valleyair.org/transportation/ceqa_idx.htm (accessed May 2024).

2 Crawford & Bowen Planning, Inc. 2024. *Dinuba Apartments Trip Generation.* April.

Construction activities for the project include site preparation, grading, building construction, paving, and architectural coating. The proposed project would not require the import or export of soil. Grading, site preparation, and building activities would involve the use of standard earthmoving equipment such as large excavators, cranes, and other related equipment.

EXISTING LAND USES IN THE PROJECT AREA

For the purposes of this analysis, sensitive receptors are areas of the population that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include residences, schools, daycare centers, hospitals, parks, and similar uses that are sensitive to air quality. Impacts on sensitive receptors are of particular concern because those receptors are the population most vulnerable to the effects of air pollution. The project site is surrounded primarily by retail and commercial uses. The closest sensitive receptors to the project site include a multifamily residential building located east of the project site across Alta Avenue at approximately 450 feet.

ENVIRONMENTAL SETTING

Air Quality Background

Air quality is primarily a function of local climate, local sources of air pollution, and regional pollution transport. The amount of a given pollutant in the atmosphere is determined by the amount of the pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain and, for photochemical pollutants, sunshine.

A region's topographic features have a direct correlation with air pollution flow and therefore are used to determine the boundary of air basins. The proposed project is in Tulare County and is within the jurisdiction of the SJVAPCD, which regulates air quality in the San Joaquin Valley Air Basin (SJVAB).

The SJVAB is comprised of approximately 25,000 square miles and covers all of seven counties including Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare, and the western portion of an eighth, Kern. The SJVAB is defined by the Sierra Nevada mountains in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is topographically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. An aerial view of the SJVAB would simulate a "bowl" opening only to the north. These topographic features restrict air movement through and out of the basin.

Both the State of California (State) and federal government have established health-based Ambient Air Quality Standards for six criteria air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter ($PM_{2.5}$ and PM_{10}). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Two criteria pollutants, O_3 and NO_2, are considered regional pollutants because they (or their precursors) affect air quality on a regional scale. Pollutants such as CO, SO_2, and Pb are considered local pollutants that tend to accumulate in the air locally.

Air quality monitoring stations are located throughout the nation and are maintained by the local air districts and State air quality regulating agencies. Data collected at permanent monitoring stations are used by the United States Environmental Protection Agency (USEPA) to identify regions as "attainment" or "nonattainment" depending on whether the regions meet the requirements stated in the applicable National Ambient Air Quality Standards (NAAQS). Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment (e.g., marginal, moderate, serious, severe, and extreme) are used to classify each air basin in the State on a pollutant-by-pollutant basis. The classifications are used as a foundation to create air quality management strategies to improve air quality and to comply with the NAAQS. As shown in Table A, the Basin is designated as nonattainment by federal standards for O_3 and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) and nonattainment by State standards for O_3, particulate matter less than 10 microns in diameter (PM_{10}), and $PM_{2.5}$.

Table A: Attainment Status of Criteria Pollutants in the San Joaquin Valley Air Basin

Pollutant	State	Federal
Ozone (1-hour)	Revoked	Nonattainment/Severe
Ozone (8-hour)	Nonattainment/Extreme	Nonattainment
PM_{10}	Attainment	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Sulfates	No Federal Standard	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified

Source: San Joaquin Valley Air Pollution Control District (2024).
PM_{10} = particulate matter less than 10 microns in diameter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter

Ozone levels, as measured by peak concentrations and the number of days over the State 1-hour standard, have declined substantially as a result of aggressive programs by the SJVAPCD and other regional, State, and federal agencies. The reduction of peak concentrations represents progress in improving public health; however, the SJVAPCD still exceeds the State standard for 1-hour and 8-hour O_3 levels. In addition, the SJVAB was designated as a serious nonattainment area for the federal 1997 8-hour ozone level in June 2004. The USEPA lowered the 1997 0.80 parts per million (ppm) national 8-hour ozone standard to 0.75 ppm in 2008 and then to 0.70 ppm on October 1, 2015. The valley is classified as nonattainment for the 1-hour and 8-hour ozone standards at the State and federal levels, although a request for redesignation as attainment of the 1-hour ozone standard was submitted to the USEPA in 2014. During the 2021–2023 period, the Visalia Air

Monitoring Station located on North Church Street (the closest monitoring station to the project site) recorded the following exceedances of the State and federal 1-hour and 8-hour O_3 standards.[1]

- The federal 8-hour ozone standard had 51 exceedances in 2021, and an unknown number of exceedances in 2022 and 2023.
- The State 8-hour ozone standard had 52 exceedances in 2021 and an unknown number of exceedances in 2022 and 2023.
- The federal 1-hour ozone standard had no exceedances in 2021 and an unknown number of exceedances in 2022 and 2023.
- The State 1-hour ozone standard had 14 exceedances in 2021 and an unknown number of exceedances in 2022 and 2023.

National and State standards have also been established for $PM_{2.5}$ over 24-hour and yearly averaging periods. $PM_{2.5}$, because of the small size of individual particles, can be especially harmful to human health. $PM_{2.5}$ is emitted by common combustion sources such as cars, trucks, buses, and power plants, in addition to ground-disturbing activities. On February 7, 2024, the EPA strengthened the NAAQS for $PM_{2.5}$ by revising the primary (health-based) annual standard from 12.0 micrograms per cubic meter ($\mu g/m^3$) to 9.0 $\mu g/m^3$; however, a new attainment designation has not been issued. The SJVAB is considered a nonattainment area for the $PM_{2.5}$ standard at the State and federal levels. During the 2021–2023 period, the Visalia Air Monitoring Station recorded the following exceedances of the federal 24-hour $PM_{2.5}$ standards. The State 24-hour $PM_{2.5}$ standards had no exceedances in the 3-year period.

- The federal 24-hour $PM_{2.5}$ standard had 43 exceedances in 2021 and an unknown number of exceedances in 2022 and 2023.

The SJVAPCD is classified as a PM_{10} nonattainment area at the State level and was redesignated from serious nonattainment to attainment of the federal PM_{10} standard in 2008. Because the SJVAPCD was redesignated from nonattainment to attainment, a PM_{10} maintenance plan was adopted in 2007 and is required to be updated every 10 years. From 2021 to 2023, the Visalia Air Monitoring Station recorded the following exceedances of the federal and State 24-hour PM_{10} standards:

- The federal 24-hour PM_{10} standard had 4 exceedances in 2021, no exceedances in 2022, and an unknown number of exceedances in 2023.
- The State 24-hour PM_{10} standard had 141 exceedances in 2021, no exceedances in 2022, and an unknown number of exceedances in 2023.

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1 California Air Resources Board (CARB). 2020. iADAM Air Quality Data Statistics. Website: https://www.arb.ca.gov/adam/topfour/topfour1.php (accessed May 2024).

No exceedances of the State or federal CO standards have been recorded at any of the region's monitoring stations since 1991. The SJVAB is currently considered an attainment area for State and federal 8-hour and 1-hour CO standards.

Toxic Air Contaminant Background

The public's exposure to toxic air contaminants (TACs) is a significant environmental health issue in the State of California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. Health and Safety Code §39655 defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant pursuant to Subsection (b) of United States Code [USC] Title 42, Section 7412, is a TAC. Under State law, the California Environmental Protection Agency (CalEPA), acting through the California Air Resources Board (CARB), is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or that may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (the Tanner Air Toxics Act), AB 2588 (the Air Toxics "Hot Spot" Information and Assessment Act of 1987), and Senate Bill (SB) 25 (the Children's Environmental Health Protection Act). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. Once TACs are identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology (T-BACT) to minimize emissions.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987 (AB 2588). Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the designated air quality management district or air pollution control district. High-priority facilities are required to perform a Health Risk Assessment (HRA) and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

To date, CARB has designated nearly 200 compounds as TACs. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (DPM).

Energy

Electricity

Electricity is a manmade resource. The production of electricity requires the consumption or conversion of energy resources (including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources) into energy. Electricity is used for a variety of purposes (e.g., lighting, heating, cooling, and refrigeration, and for operating appliances, computers, electronics, machinery, and public transportation systems).

According to the most recent data available, in 2022, California's electricity was generated primarily by natural gas (47.5 percent), renewable sources (52.2 percent), large hydroelectric (7.2 percent), nuclear (8.7 percent), coal (<1.0 percent), and other unspecified sources. Total electric generation in California in 2022 was 287,220 gigawatt-hours (GWh), up 3.4 percent from the 2021 total generation of 277,764 GWh.[1]

The project site receives its electricity from PG&E. According to the California Energy Commission (CEC), total electricity consumption in the PG&E service area in 2022 was 104,695.0 GWh (35,245.7 GWh for the residential sector and 69,449.3 GWh for the nonresidential sector).[2] Total electricity consumption in Tulare County in 2022 was 4,957.7 GWh (or 4,957,696,254 kilowatt-hours [kWh]).[3]

Natural Gas

Natural gas is a nonrenewable fossil fuel. Fossil fuels are formed when layers of decomposing plant and animal matter are exposed to intense heat and pressure under the surface of the Earth over millions of years. Natural gas is a combustible mixture of hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas is found in naturally occurring reservoirs in deep underground rock formations. Natural gas is used for a variety of uses (e.g., heating buildings, generating electricity, and powering appliances such as stoves, washing machines and dryers, gas fireplaces, and gas grills).

Natural gas consumed in California is used for electricity generation (45 percent), residential uses (21 percent), industrial uses (25 percent), and commercial uses (9 percent). California continues to depend on out-of-state imports for nearly 90 percent of its natural gas supply.[4]

PG&E is the natural gas service provider for the project site. According to the CEC, total natural gas consumption in the PG&E service area in 2022 was 4,449.2 million therms (1,866.2 million therms

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1 California Energy Commission (CEC). 2022. *2022 Total System Electric Generation*. Website: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation (accessed May 2024).

2 CEC. 2021. Electricity Consumption by Entity. Website: http://www.ecdms.energy.ca.gov/elecbyutil.aspx (accessed May 2024).

3 CEC. 2020. Electricity Consumption by County and Entity. Websites: http://www.ecdms.energy.ca.gov/elecbycounty.aspx and http://www.ecdms.energy.ca.gov/elecbyutil.aspx (accessed May 2024).

4 CEC. 2021. Supply and Demand of Natural Gas in California. Website: https://www.energy.ca.gov/data-reports/energy-almanac/californias-natural-gas-market/supply-and-demand-natural-gas-california (accessed May 2024).

for the residential sector and 2,583.0 million therms for the nonresidential sector).[1] Total natural gas consumption in Tulare County in 2022 was 164.6 million therms (164,629,109 therms).[2]

Fuel

Petroleum is also a nonrenewable fossil fuel. Petroleum is a thick, flammable, yellow-to-black mixture of gaseous, liquid, and solid hydrocarbons that occurs naturally beneath the Earth's surface. Petroleum is primarily recovered by oil drilling. It is refined into a large number of consumer products, primarily fuel oil, gasoline, and diesel.

The average fuel economy for light-duty vehicles (autos, pickups, vans, and SUVs) in the United States has steadily increased from about 14.9 miles per gallon (mpg) in 1980 to 22.9 mpg in 2021.[3] Federal fuel economy standards have changed substantially since the Energy Independence and Security Act was passed in 2007. This act, which originally mandated a national fuel economy standard of 35 mpg by year 2020[4], applies to cars and light trucks of Model Years 2011 through 2020. In March 2020, the USEPA and National Highway Traffic Safety Administration (NHTSA) finalized the Corporate Average Fuel Economy standards for Model Years 2024–2026 Passenger Cars and Light Trucks, further detailed below.

Gasoline is the most used transportation fuel in California, with 97 percent of all gasoline being consumed by light-duty cars, pickup trucks, and sport utility vehicles. According to the most recent data available, in 2022, total gasoline consumption in California was 316,425 thousand barrels or 1,597.6 trillion British Thermal Units (BTU).[5] Of the total gasoline consumption, 299,304 thousand barrels or 1,511.2 trillion BTU were consumed for transportation.[6] Based on fuel consumption obtained from CARB's California Emissions Factor Model, Version 2021 (EMFAC2021), approximately 197.1 million gallons of gasoline and approximately 65 million gallons of diesel will be consumed from vehicle trips in Tulare County in 2024.

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[1] CEC. 2021. Gas Consumption by Entity. Website: http://www.ecdms.energy.ca.gov/gasbyutil.aspx (accessed May 2024).

[2] CEC. 2020. Gas Consumption by County and Entity. Website: http://www.ecdms.energy.ca.gov/gasbycounty.aspx and http://www.ecdms.energy.ca.gov/gasbyutil.aspx (accessed May 2024).

[3] U.S. Department of Transportation (USDOT). "Table 4-23: Average Fuel Efficiency of U.S. Light Duty Vehicles." Website: https://www.bts.dot.gov/bts/bts/content/average-fuel-efficiency-us-light-duty-vehicles (accessed May 2024).

[4] U.S. Department of Energy. 2007. "Energy Independence & Security Act of 2007." Website: https://www.afdc.energy.gov/laws/eisa (accessed May 2024).

[5] U.S. Energy Information Administration (EIA). 2022. California State Profile and Energy Estimates, Data. Website: www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_mg.html&sid=CA (accessed May 2024).

[6] Ibid.

Greenhouse Gas Background

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2);
- Methane (CH_4);
- Nitrous oxide (N_2O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur hexafluoride (SF_6).

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally occurring GHGs such as CO_2, CH_4, and N_2O, some gases, such as HFCs, PFCs, and SF_6, are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

REGULATORY FRAMEWORK

This section provides regulatory background information for air quality, GHGs, and energy.

Air Quality

Federal Regulations

The 1970 federal Clean Air Act (CAA) authorized the establishment of national health-based air quality standards and set deadlines for their attainment. The CAA Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required for areas of the nation that exceed the standards. Under the CAA, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards by specified dates.

State Regulations

In 1988, the California Clean Air Act (CCAA) required that all air districts in the State endeavor to achieve and maintain California Ambient Air Quality Standards (CAAQS) for CO, O_3, SO_2, and NO_2 by the earliest practical date. The CCAA provides districts with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

The CARB is the State's "clean air agency." The CARB's goals are to attain and maintain healthy air quality, protect the public from exposure to toxic air contaminants, and oversee compliance with air pollution rules and regulations.

Regional Regulations

San Joaquin Valley Air Pollution Control District. The SJVAPCD has specific air quality-related planning documents, rules, and regulations. This section summarizes the local planning documents and regulations that may be applicable to the proposed project as administered by the SJVAPCD with CARB oversight.

- **Rule 8011—General Requirements: Fugitive Dust Emission Sources.** Fugitive dust regulations are applicable to outdoor fugitive dust sources. Operations, including construction operations, must control fugitive dust emissions in accordance with SJVAPCD Regulation VIII. According to Rule 8011, the SJVAPCD requires the implementation of control measures for fugitive dust emission sources.

- **Regulation VIII – Fugitive PM_{10} Prohibitions.** Rules 8011–8081 are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, etc. All development projects that involve soil disturbance are subject to at least one provision of the Regulation VIII series of rules.

- **Rule 2201** – **New and Modified Stationary Source Review Rule.** This rule provides the review of new and modified stationary sources of air pollution to operate without interfering with the attainment or maintenance of ambient air quality standards and results in no net increase in emissions above specified thresholds.

- **Rule 4901 – Wood Burning Fireplaces and Wood Burning Heaters.** The purpose of this rule is to limit emissions of carbon monoxide and particulate matter from wood burning fireplaces, wood burning heaters, and outdoor wood burning devices.

- **Rule 9510 – Indirect Source Review.** This rule reduces the impact of nitrogen oxides (NO_x) and PM_{10} emissions from new development projects. The rule places application and emission reduction requirements on development projects meeting applicability criteria in order to reduce emissions through on-site mitigation, off-site SJVAPCD-administered projects, or a combination of the two. Compliance with SJVAPCD Rule 9510 reduces emissions impacts through incorporation of on-site measures as well as payment of an off-site fee that funds emission reduction projects in the Air Basin. The emissions analysis for Rule 9510 is detailed and is dependent on the exact project design that is expected to be constructed or installed. Compliance with Rule 9510 is separate from the California Environmental Quality Act (CEQA) process, though the control measures used to comply with Rule 9510 may be used to mitigate significant air quality impacts.

Guidance for Assessing and Mitigating Air Quality Impacts. The SJVAPCD prepared the GAMAQI to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SJVAB. The GAMAQI provides SJVAPCD-recommended procedures for evaluating potential air quality impacts during the CEQA environmental review process. The GAMAQI provides guidance on evaluating short-term (construction) and long-term (operational) air emissions. The most recent version of the GAMAQI, adopted on March 19, 2015, was used in this evaluation. It contains guidance on the following:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact
- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts
- Methods to mitigate air quality impacts
- Information for use in air quality assessments and environmental documents, including air quality, regulatory setting, climate, and topography data.

Tulare County Association of Governments. The Tulare County Association of Governments (TCAG) is responsible for regional transportation planning in Tulare County and participates in developing mobile source emission inventories used in air quality attainment plans.***Regional Transportation Plan/Sustainable Communities Strategy.¶*** Regional Transportation Plans (RTPs) are State-mandated plans that identify long-term transportation needs for a region's transportation network. The TCAG 2022 RTP/SCS charts the long-range vision of regional transportation in Tulare County through the year 2046. The RTP identifies existing and future transportation-related needs, while considering all modes of travel, analyzing alternative solutions, and identifying priorities for the anticipated available funding for the projects and multiple programs included within it. SB 375, which went into effect in 2009, added statutes to the California Government Code to encourage planning practices that create sustainable communities. It calls for each metropolitan planning organization to prepare a Sustainable Communities Strategy (SCS) as an integrated element of the RTP that is to be updated every 4 years. The SCS is intended to show how integrated land use and transportation planning can lead to lower GHG emissions from autos and light trucks. TCAG has included the SCS in its 2022 RTP.

Transportation Conformity.¶ TCAG must ensure that transportation plans and projects comply with federal Transportation Conformity. Transportation conformity is a way to ensure that federal funding and approval are given to those transportation activities that are consistent with air quality goals. It ensures that these transportation activities do not worsen air quality or interfere with the purpose of the State Implementation Plan, which is to meet the NAAQS. Meeting the NAAQS often requires emissions reductions from mobile sources. According to the Clean Air Act, transportation plans, programs, and projects cannot:

- Create new NAAQS violations;
- Increase the frequency or severity of existing NAAQS violations; or
- Delay attainment of the NAAQS.

Air quality plans include criteria pollutant emission budgets required for attainment of air quality standards by mandated deadlines. The budgets must not be exceeded considering projected growth in mobile source activity. The TCAG 2022 Conformity Analysis determined that the conformity tests for ozone, PM_{10}, and $PM_{2.5}$ revealed that all years are projected to be less than the approved emissions budgets and, as such, the conformity tests are satisfied.

Local Regulations

City of Dinuba General Plan. The City of Dinuba addresses air quality in the Open Space, Conservation, and Recreation Element of the City's General Plan[1]. The Open Space, Conservation, and Recreation Element contains goals and policies that work to protect the health and welfare of Dinuba residents by promoting development that is compatible with air quality standards. Applicable air quality policies and action items from the Open Space, Conservation, and Recreation Element are listed below:

- **Policy 3.46.** Require area and stationary source projects that generate significant amounts of air pollutants to incorporate air quality mitigation in their design, including:
  - The use of best available and economically feasible control technology for stationary industrial sources;
  - The use of EPA Phase II certified wood burning heater or pellet stoves in new residential units;
  - The use of new and replacement fuel storage tanks at refueling stations that are clean fuel compatible, if technically and economically feasible; and
  - The promotion of energy efficient designs, including provisions for solar access, building siting to maximize natural heating and cooling, and landscaping to aid passive cooling and to protect from winter winds.

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[1] City of Dinuba. 2008. *City of Dinuba General Plan Policies Statement*. September. Website: https://www.dinuba.org/images/docs/forms/General_Plan_Policies.pdf (accessed May 2024).

- **Policy 3.48.** Encourage transportation alternatives to motor vehicles by developing infrastructure amenable to such alternatives by doing the following:
  - Consider right-of-way requirements for bike usage in the planning of new arterial and collector streets and in street improvement projects;
  - Require that new development be designed to promote pedestrian and bicycle access and circulation; and
  - Provide safe and secure bicycle parking facilities at major activity centers, such as public facilities, employment sites, and shopping and office centers.
- **Policy 3.49.** Encourage land use development to be located and designed to conserve air quality and minimize direct and indirect emissions of air contaminants by doing the following:
  - Locate air pollution point sources, such as manufacturing and extracting facilities in areas designated for industrial development and separated from residential areas and sensitive receptors (e.g., homes, schools, and hospitals);
  - Establish buffer zones (e.g., setbacks, landscaping) within residential and other sensitive receptor uses to separate those uses from highways, arterials, hazardous material locations and other sources of air pollution or odor;
  - Consider the jobs/housing/balance relationship (i.e., the proximity of industrial and commercial uses to major residential areas) when making land use decisions;
  - Provide for mixed-use development through land use and zoning to reduce the length and frequency of vehicle trips;
  - Accommodate a portion of the projected population and economic growth of the City in areas having the potential for revitalization;
  - Locate public facilities (libraries, parks, schools, community centers, etc.) with consideration of transit and other transportation opportunities;
  - Encourage small neighborhood-serving commercial uses within or adjacent to residential neighborhoods when such areas are aesthetically compatible with adjacent areas; do not create conflicts with neighborhoods schools; minimize traffic, noise, and lighting impacts; encourage and accommodate pedestrian and bicycle access; and, are occupied by commercial uses that have a neighborhood-scale market area rather than a community-wide market area; and
  - Encourage a development pattern that is contiguous with existing developed areas of the City.

Energy

Federal and State agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation (USDOT), the United States Department of Energy, and the USEPA are three federal agencies with substantial influence over energy policies and programs. Generally, federal agencies influence and regulate transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy-related research and development projects, and through funding for transportation infrastructure improvements. On the State level, the California Public Utilities Commission (CPUC) and the CEC are two agencies with authority over different aspects of energy.

The CPUC regulates privately owned electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies and serves the public interest by protecting consumers and ensuring the provision of safe, reliable utility service and infrastructure at reasonable rates, with a commitment to environmental enhancement and a healthy California economy.

The CEC is the State's primary energy policy and planning agency. The CEC forecasts future energy needs, promotes energy efficiency, supports energy research, develops renewable energy resources, and plans for/directs State response to energy emergencies. The applicable federal, State, regional, and local regulatory framework is discussed below.

Federal Regulations

Energy Policy Act of 2005. The Energy Policy Act of 2005 seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under this Act, consumers and businesses can obtain federal tax credits for purchasing fuel-efficient appliances and products (including hybrid vehicles), building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

Corporate Average Fuel Economy Standards. On March 31, 2022, the NHTSA finalized the Corporate Average Fuel Economy (CAFE) standards for Model Years 2024–2026 Passenger Cars and Light Trucks. The amended CAFE standards would require an industry wide fleet average of approximately 49 mpg for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024–2025, and 10 percent annually for model year 2026. The final standards are estimated to save about 234 billion gallons of gasoline between model years 2030 to 2050.

State Regulations

Assembly Bill 1575, Warren-Alquist Act. In 1975, largely in response to the oil crisis of the 1970s, the State Legislature adopted AB 1575 (also known as the Warren-Alquist Act), which created the CEC. The statutory mission of the CEC is to forecast future energy needs; license power plants of 50 megawatts (MW) or larger; develop energy technologies and renewable energy resources; plan for and direct State responses to energy emergencies; and, perhaps most importantly, promote energy efficiency through the adoption and enforcement of appliance and building energy efficiency standards. AB 1575 also amended Public Resources Code (PRC) Section 21100(b)(3) and *State CEQA Guidelines* Section 15126.4 to require Environmental Impact Reports (EIRs) to include, where relevant, mitigation measures proposed to minimize the wasteful, inefficient, and unnecessary consumption of energy caused by a project. Thereafter, the State Resources Agency created Appendix F to the *State CEQA Guidelines*. Appendix F assists EIR preparers in determining whether a project will result in the inefficient, wasteful, and unnecessary consumption of energy. Appendix F of the *State CEQA Guidelines* also states that the goal of conserving energy implies the wise and efficient use of energy and the means of achieving this goal, including (1) decreasing overall per capita energy consumption; (2) decreasing reliance on fossil fuels such as coal, natural gas, and oil; and (3) increasing reliance on renewable energy sources.

Senate Bill 1389, Energy: Planning and Forecasting. In 2002, the State Legislature passed SB 1389, which required the CEC to develop an integrated energy plan every 2 years for electricity, natural gas, and transportation fuels for the California Energy Policy Report. 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 (ZEVs) and their infrastructure needs, and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

In compliance with the requirements of SB 1389, the CEC adopts an Integrated Energy Policy Report every 2 years and an update every other year. The most recently adopted report includes the *2023 Integrated Energy Policy Report.*[1] The *Integrated Energy Policy Report* covers a broad range of topics, including decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecast, and the California Energy Demand Forecast. The *Integrated Energy Policy Report* provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs.

Renewable Portfolio Standard. SB 1078 established the California Renewable Portfolio Standards program in 2002. SB 1078 initially required that 20 percent of electricity retail sales be served by renewable resources by 2017; however, this standard has become more stringent over time. In 2006, SB 107 accelerated the standard by requiring that the 20 percent mandate be met by 2010. In April 2011, SB 2 required that 33 percent of electricity retail sales be served by renewable resources by 2020. In 2015, SB 350 established tiered increases to the Renewable Portfolio Standards of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. In 2018, SB 100 increased the

1 CEC. 2023. *2023 Integrated Energy Policy Report*. California Energy Commission. Docket Number: 23-IEPR-01.

requirement to 60 percent by 2030 and required that all the State's electricity come from carbon-free resources by 2045. SB 100 took effect on January 1, 2019.[1]

Title 24, California Building Code. Energy consumption by new buildings in California is regulated by the Building Energy Efficiency Standards, embodied in Title 24 of the California Code of Regulations (CCR), known as the California Building Code (CBC). The CEC first adopted the Building Energy Efficiency Standards for Residential and Non-residential Buildings in 1978 in response to a legislative mandate to reduce energy consumption in the State. The CBC is updated every 3 years, with the most recent update consisting of the 2022 CBC that became effective January 1, 2023. The efficiency standards apply to both new construction and rehabilitation of both residential and nonresidential buildings, and regulate energy consumed for heating, cooling, ventilation, water heating, and lighting. The building efficiency standards are enforced through the local building permit process. Local government agencies may adopt and enforce energy standards for new buildings, provided these standards meet or exceed those provided in CCR Title 24.

California Green Building Standards Code (CALGreen Code). In 2010, the California Building Standards Commission (CBSC) adopted Part 11 of the Title 24 Building Energy Efficiency Standards, referred to as the California Green Building Standards Code (CALGreen Code). The CALGreen Code took effect on January 1, 2011. The CALGreen Code is updated on a regular basis, with the most recent update consisting of the 2022 CALGreen Code standards that became effective January 1, 2023. The CALGreen Code established mandatory measures for residential and nonresidential building construction and encouraged sustainable construction practices in the following five categories: (1) planning and design, (2) energy efficiency, (3) water efficiency and conservation, (4) material conservation and resource efficiency, and (5) indoor environmental quality. Although the CALGreen Code was adopted as part of the State's efforts to reduce GHG emissions, the CALGreen Code standards have co-benefits of reducing energy consumption from residential and nonresidential buildings subject to the standard.

California Energy Efficiency Strategic Plan. On September 18, 2008, the CPUC adopted California's first Long-Term Energy Efficiency Strategic Plan, presenting a roadmap for energy efficiency in California. The Strategic Plan was updated in 2011. The Plan articulates a long-term vision and goals for each economic sector and identifies specific near-term, mid-term, and long-term strategies to assist in achieving those goals. The Plan also reiterates the following four specific programmatic goals known as the "Big Bold Energy Efficiency Strategies" that were established by the CPUC in Decisions D.07-10-032 and D.07-12-051:

- All new residential construction will be zero net energy (ZNE) by 2020.
- All new commercial construction will be ZNE by 2030.
- 50 percent of commercial buildings will be retrofitted to ZNE by 2030.
- 50 percent of new major renovations of State buildings will be ZNE by 2025.

[1] California Public Utilities Commission (CPUC). 2019. Renewables Portfolio Standard Program. Website: cpuc.ca.gov/rps (accessed May 2024).

Regional Regulations

There are no regional regulations that apply to the proposed project.

Local Regulations

City of Dinuba General Plan. The City's General Plan contains policies indirectly related to energy efficiency. This includes measures to improve transit efficiency, reduce air emissions, and require the implementation of energy saving features such as solar energy systems, water efficient landscaping, and energy efficient, sustainable building standards.

Greenhouse Gas Emissions

This section describes regulations related to global climate change at the federal, State, and local level.

Federal Regulations

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the CAA.

While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change, including the 2009 USEPA final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding action in 2009 under the CAA, finding that seven GHGs (CO_2, CH_4, N_2O, HFCs, NF_3, PFCs, and SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national GHG emission standards.

State Regulations

The CARB is the lead agency for implementing climate change regulations in the State. Since its formation, the CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State are described below.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is AB 32, passed by the State legislature on August 31, 2006. This effort set a GHG emission reduction target to reduce GHG emissions to 1990 levels by 2020. The CARB has established the level of GHG emissions in 1990 at 427 million metric tons (MMT) CO_2e. The emissions target of 427 MMT CO_2e requires the reduction of 169 MMT from the State's projected business-as-usual 2020 emissions of 596 MMT. AB 32 requires the CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The CARB approved the Scoping Plan on December 11, 2008. It contains the main strategies California will implement to achieve the reduction of approximately 169 MMT CO_2e, or approximately 30 percent, from the State's projected 2020 emission level of 596 MMT 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). The Scoping Plan also includes CARB-recommended GHG reductions 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 reduction 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 approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB climate change priorities until 2020 and sets the groundwork to reach long-term goals set forth in Executive Orders (EOs) S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals as defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use. The CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[1] to reflect the 2030 target set by EO B-30-15 and codified by SB 32.

The 2022 Scoping Plan[2] was approved in December 2022 and assesses progress towards achieving the SB 32 2030 target and lay out a path to achieve carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

Senate Bill 375 (2008). Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, the CARB approved GHG reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). The CARB may update the targets every 4 years and must update them every 8 years. MPOs, in turn, must demonstrate how their plans, policies, and transportation investments meet the targets set by the CARB through SCSs. The SCSs are included with the Regional Transportation Plan, a report required by State law. However, if an MPO finds that

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1 CARB. 2017. *California's 2017 Climate Change Scoping Plan*. November. Website: ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf (accessed May 2024).

2 CARB. 2022. *2022 Scoping Plan Update*. Website: https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp.pdf (accessed May 2024).

its SCS will not meet the GHG reduction target, it may prepare an Alternative Planning Strategy (APS). The APS identifies the impediments to achieving the targets.

Executive Order B-30-15 (2015). Governor Jerry Brown signed EO B-30-15 on April 29, 2015, which added the immediate target of:

- GHG emissions should be reduced to 40 percent below 1990 levels by 2030.

All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. The CARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target, and, therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue reducing emissions.

Senate Bill 350 (2015) Clean Energy and Pollution Reduction Act. SB 350, signed by Governor Jerry Brown on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's renewable portfolio standard from 33 percent to 50 percent; and
- Increase energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the CPUC for the private utilities and by the CEC for municipal utilities. Each utility must submit a procurement plan showing it will purchase clean energy to displace other nonrenewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to State energy agencies under existing law. The addition made by this legislation requires State energy agencies to plan for and implement those programs in a manner that achieves the energy efficiency target.

Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197. In summer 2016, the Legislature passed and the Governor signed SB 32 and AB 197. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 EO B-30-15. SB 32 builds on AB 32 and keeps California on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change analysis of the emission trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million CO_2e and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air pollutant emissions data that are collected by the CARB was posted in December 2016.

Senate Bill 100. On September 10, 2018, Governor Brown signed SB 100, which raises California's renewable portfolio standard requirements to 60 percent by 2030, with interim targets, and 100 percent by 2045. The bill also establishes a State policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045. Under the bill, the State cannot increase carbon emissions elsewhere in the Western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18. EO B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." EO B-55-18 directs the CARB to work with relevant State agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

Assembly Bill 1279.AB 1279 was signed in September of 2022 and codifies the State goals of achieving net carbon neutrality by 2045 and maintaining net negative GHG emissions thereafter. This bill also requires California to reduce statewide GHG emissions by 85 percent compared to 1990 levels by 2045 and directs CARB to work with relevant state agencies to achieve these goals.

Regional Regulations

San Joaquin Valley Air Pollution Control District. Tulare County is located within the SJVAB, which is under the jurisdiction of the SJVAPCD. The SJVAPCD has regulatory authority over certain stationary and industrial GHG emission sources and provides voluntary technical guidance on addressing GHGs for other emission sources in a CEQA context. SJVAPCD initiatives related to GHGs are described below:

Climate Change Action Plan. The San Joaquin Valley Air Pollution Control District Climate Change Action Plan (CCAP) was adopted on August 21, 2008. The CCAP includes suggested best performance standards (BPS) for proposed development projects. However, the SJVAPCD's CCAP was adopted in 2009 and was prepared based on the State's 2020 GHG targets, which are now superseded by State policies (i.e., the 2019 California Green Building Code) and the 2030 GHG targets, established in SB 32.

San Joaquin Valley Carbon Exchange and Rule 2301. The SJVAPCD initiated work on the San Joaquin Valley Carbon Exchange in November 2008. The Exchange was implemented with the adoption of Amendments to Rule 2301 Emission Reduction Credit Banking on January 19, 2012. The purpose of the carbon exchange is to quantify, verify, and track voluntary GHG emissions reductions generated within the San Joaquin Valley.

The SJVAPCD incorporated a method to register voluntary GHG emission reductions with amendments to Rule 2301. The purposes of the amendments to the rule include the following:

- Provide an administrative mechanism for sources to bank voluntary GHG emission reductions for later use.

- Provide an administrative mechanism for sources to transfer banked GHG emission reductions to others for any use.

- Define eligibility standards, quantitative procedures, and administrative practices to ensure that banked GHG emission reductions are real, permanent, quantifiable, surplus, and enforceable.

The SJVAPCD is participating in a new program developed by the California Air Pollution Control Officers Association (CAPCOA) to encourage banking and use of GHG reduction credits referred to as the CAPCOA Greenhouse Gas Reduction Exchange (GHGRx). The GHGRx provides information on GHG credit projects within participating air districts. The SJVAPCD is one of the first districts to have offsets available for trading on the Exchange.

Local Regulations

City of Dinuba General Plan. The City's General Plan contains policies indirectly related to GHGs. This includes measures to improve transit efficiency, reduce air emissions, increase ridesharing, promote mixed land uses, and require the implementation of energy saving features such as solar energy systems, water efficient landscaping, and energy efficient, sustainable building standards.

METHODOLOGY

Construction Emissions

Construction activities can generate a substantial amount of air pollution. Construction activities are considered temporary; however, short-term impacts can contribute to exceedances of air quality standards. Construction activities include site preparation, earthmoving, and general construction. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips.

The California Emissions Estimator Model (CalEEMod) Version 2022.1 computer program was used to calculate emissions from on-site construction equipment and emissions from worker and vehicle trips to the site. The construction schedule of the proposed project is not yet known. Therefore, this analysis utilizes a CalEEMod default construction schedule, which anticipates construction to begin in July 2024 and occur for approximately 14 months, ending in 2025. This represents a conservative analysis, because if the proposed construction activities should occur at a later timeframe, estimated emissions would be expected to decrease into the future due to technological advances and the implementation of forthcoming regulatory requirements. The proposed project would not require the import or export of soil, which was also included in CalEEMod. This analysis also assumes use of Tier 2 construction equipment. Other detailed construction information is currently unavailable; therefore, this analysis utilizes CalEEMod default assumptions.

Operational Emissions

The air quality analysis includes estimating emissions associated with long-term operation of the proposed project. Consistent with the SJVAPCD guidance for estimating emissions associated with land use development projects, the CalEEMod computer program was used to calculate the long-term operational emissions associated with the project.

As discussed in the Project Description section, the proposed project would include the construction of 126 multifamily residential units and associated site improvements. The proposed project analysis was conducted using land use codes *Apartments Low Rise* and *Parking Lot.* Trip generation rates used in CalEEMod for the project were based on the project's *Trip Generation,* which identifies that the proposed project would generate approximately 883 average daily trips.[1] In addition, consistent with SJVAPCD Rule 4901, this analysis assumes that the proposed project would not include any wood burning (or natural gas) fireplaces. The proposed project would be all-electric, which was included in CalEEMod. Where project-specific data were not available, default assumptions (e.g., energy usage, water usage, and solid waste generation) from CalEEMod were used to estimate project emissions. CalEEMod output sheets are included in Attachment B.

Energy Use

The analysis focuses on the three sources of energy that are relevant to the proposed project: electricity, the equipment fuel necessary for project construction, and vehicle fuel necessary for project operations. For the purposes of this analysis, the amount of electricity, construction fuel, and fuel use from operations are quantified and compared to that consumed in Tulare County. The electricity use of the proposed project is analyzed an annual basis. Electricity use was estimated for the project using default energy intensities by land use type in CalEEMod.

Greenhouse Gas Emissions

GHG emissions associated with the project would occur over the short term from construction activities, consisting primarily of emissions from equipment exhaust. There would also be long-term GHG emissions associated with project-related area sources, energy consumption, water conveyance and treatment, and waste generation.

THRESHOLDS OF SIGNIFICANCE

Air Quality

The *State CEQA Guidelines* indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would do any of the following:

- 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 is nonattainment under applicable federal or State ambient air quality standards;

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[1] Crawford & Bowen Planning, Inc. 2024. *Dinuba Apartments Trip Generation.* April.

- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) affecting a substantial number of people.

Regional Emissions Thresholds

The SJVAPCD defines emissions thresholds in the GAMAQI, established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emission thresholds are regarded as conservative and would overstate an individual project's contribution to health risks (see Table B). The related impacts are discussed further in the Project Impacts section.

Table B: Regional Thresholds for Construction and Operational Emissions

Emissions Source	Pollutant Emissions Threshold (Tons per Year)					
	CO	NO_X	ROG	SO_X	PM_{10}	$PM_{2.5}$
Construction	100	10	10	27	15	15
Operations	100	10	10	27	15	15

Source: *Guidance for Assessing and Mitigating Air Quality Impacts* (SJVAPCD 2015).
CO = carbon monoxide
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_X = sulfur oxides

Local Microscale Concentration Standards

The significance of localized project impacts under CEQA depends on whether ambient CO levels in the vicinity of the project are above or below State and federal CO standards. Because ambient CO levels are below the standards throughout the Basin, a project would be considered to have a significant CO impact if project emissions result in an exceedance of one or more of the 1-hour or 8-hour standards. The following are applicable local emission concentration standards for CO:

- California State 1-hour CO standard of 20 ppm
- California State 8-hour CO standard of 9 ppm

Health Risk Thresholds

Both the State and federal governments have established health-based ambient air quality standards (AAQS) for seven air pollutants. For other air pollutants without defined significance standards, the definition of substantial pollutant concentrations varies. For TACs, "substantial" is taken to mean that the individual health risk exceeds a threshold considered to be a prudent risk management level.

The following limits for maximum individual cancer risk (MICR) and noncancer acute and chronic Hazard Index (HI) from project emissions of TACs are considered appropriate for use in determining the health risk for projects in the Basin:

- **MICR:** MICR is the estimated probability of a maximum exposed individual (MEI) contracting cancer as a result of exposure to TACs over a period of 30 years for adults and 9 years for children in residential locations, 350 days per year. The SJVAPCD's *Update to the District's Risk Management Policy to Address the OEHHA Revised Risk Assessment Guidance Document* states that emissions of TACs are considered significant if an HRA shows an increased risk of greater than 20 in 1 million.

- **Chronic HI:** Chronic HI is the ratio of the estimated long-term level of exposure to a TAC for a potential MEI to its chronic reference exposure level. The chronic HI calculations include multi-pathway consideration when applicable. The project would be considered significant if the cumulative increase in total chronic HI for any target organ system would exceed 1.0 at any receptor location.

- **Acute HI:** Acute HI is the ratio of the estimated maximum 1-hour concentration of a TAC for a potential MEI to its acute reference exposure level. The project would be considered significant if the cumulative increase in total acute HI for any target organ system would exceed 1.0 at any receptor location.

Greenhouse Gas Thresholds

The State *CEQA Guidelines* indicate that a project would normally have a significant adverse GHG emission impact if the project would:

- Generate GHG 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 GHGs.

Neither the City nor the SJVAPCD has developed or adopted numeric GHG significance thresholds. Therefore, this analysis evaluates the GHG emissions based on the project's consistency with applicable State GHG reduction goals.

PROJECT IMPACTS

This section identifies the air quality, GHG, and energy impacts associated with implementation of the proposed project.

Air Quality

Air pollutant emissions associated with the project would occur over the short term from construction activities and over the long term from operational activities associated with the proposed land uses.

Consistency with Applicable Air Quality Plans

The proposed project is in a region classified as a nonattainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State air quality standards. To bring the San Joaquin Valley into attainment, the SJVAPCD adopted the *2022 Plan for the 2015 8-Hour Ozone Standard* in December 2022 to satisfy Clean Air Act requirements and ensure attainment of the 75 parts per billion (ppb) 8-hour ozone standard.[1]

To ensure the SJVAB's continued attainment of the USEPA PM_{10} standard, the SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007.[2] The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards in November 2018 to address the USEPA 1997 annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$, the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$, and the 2012 annual $PM_{2.5}$ standard of 12 $\mu g/m^3$.[3]

CEQA requires that certain proposed projects be analyzed for consistency with the applicable air quality plan. For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from a project should not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below, the proposed project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Therefore, the proposed project would not conflict with or obstruct implementation of SJVAPCD air quality plans.

Criteria Pollutant Analysis

The Basin is currently designated nonattainment for the federal and State standards for O_3 and $PM_{2.5}$. In addition, the Basin is in nonattainment for the PM_{10} standard. The Basin's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of an ambient air quality standard. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the SJVAPCD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. The following analysis assesses the potential construction- and operation-related air quality impacts.

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1 SJVAPCD. 2016. *2016 Plan for the 2008 8-Hour Ozone Standard*. June 16. Website: www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm (accessed May 2024).

2 SJVAPCD. 2007. *2007 PM_{10} Maintenance Plan and Request for Redesignation*. Website: www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed May 2024).

3 SJVAPCD. 2018. *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards*. November 15. Website: http://valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf (accessed May 2024).

Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate matter emissions (i.e., fugitive dust) generated by excavation activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, volatile organic compounds (VOCs), directly emitted $PM_{2.5}$ or PM_{10}, and toxic air contaminants such as diesel exhaust particulate matter.

Project construction would include site preparation, grading, building construction, paving, and architectural coating activities. Construction-related effects on air quality from the proposed project would be greatest during the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and amount of operating equipment. Larger dust particles would settle near the source, whereas fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The SJVAPCD has established Regulation VIII measures for reducing fugitive dust emissions (PM_{10}). With the implementation of Regulation VIII measures, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, sulfur oxides (SO_x), NO_x, VOCs, and some soot particulate ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Construction emissions were estimated for the project using CalEEMod and are summarized in Table C. Attachment B provides CalEEMod output sheets.

Table C: Short-Term Regional Construction Emissions

Construction Year	Maximum Daily Regional Pollutant Emissions (Tons per Year)					
	ROG	NO_x	CO	SO_X	PM_{10}	$PM_{2.5}$
2024	0.1	1.2	1.1	<0.1	0.1	0.1
2025	0.5	1.6	1.5	<0.1	0.1	0.1
Maximum Emissions	0.5	1.6	1.5	<0.1	0.1	0.1
SJVAPCD Threshold	**10.0**	**10.0**	**100.0**	**27.0**	**15.0**	**15.0**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (May 2024).
CO = carbon monoxide
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_x = sulfur oxides

As shown in Table C, construction emissions associated with the proposed project would not exceed the SJVAPCD's thresholds for reactive organic gas (ROG), NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions. In addition to the construction period thresholds of significance, the SJVAPCD has implemented Regulation VIII measures for dust control during construction. Implementation of Regulatory Compliance Measure (RCM) AIR-1 would ensure that the proposed project complies with Regulation VIII.

RCM AIR-1 Consistent with San Joaquin Valley Air Pollution Control District (SJVAPCD) Regulation VIII (Fugitive PM_{10} Prohibitions), the following controls are required to be included as specifications for the proposed project and implemented at the construction site:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant or covered with a tarp or other suitable cover or vegetative ground cover.

- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.

- When materials are transported off site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container shall be maintained.

- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)

- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.

Construction emissions associated with the proposed project would be less than significant with implementation of RCM AIR-1. Therefore, construction of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or State ambient air quality standard.

Operational Air Quality Impacts. Long-term air pollutant emission impacts associated with the proposed project are those related to mobile sources (e.g., vehicle trips), energy sources (e.g., natural gas), and area sources (e.g., architectural coatings and the use of landscape maintenance equipment).

Mobile source emissions include ROG and NO_X emissions that contribute to the formation of ozone. Additionally, PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways.

Energy source emissions result from activities in buildings for which natural gas is used. The quantity of emissions is the product of usage intensity (i.e., the amount of natural gas) and the emission factor of the fuel source. However, the proposed project would not include natural gas and no natural gas demand is anticipated during operation of the proposed project.

Typically, area source emissions consist of direct sources of air emissions located at the project site, including architectural coatings and the use of landscape maintenance equipment. Area source emissions associated with the project would include emissions from the use of landscaping equipment and the use of consumer products.

Long-term operational emissions associated with the proposed project were calculated using CalEEMod. Table D provides the proposed project's estimated operational emissions. Attachment B provides CalEEMod output sheets.

Table D: Project Operational Emissions

Emission Type	Pollutant Emissions (Tons per Year)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Mobile Sources	0.6	0.5	3.5	<0.1	0.6	0.2
Area Sources	0.6	<0.1	0.6	<0.1	<0.1	<0.1
Energy Sources	0.0	0.0	0.0	0.0	0.0	0.0
Total Project Emissions	**1.2**	**0.5**	**4.1**	**<0.1**	**0.6**	**0.2**
SJVAPCD Threshold	10.0	10.0	100.0	27.0	15.0	15.0
Exceeds Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (May 2024).
Note: Some values may not appear to add correctly due to rounding.
CO = carbon monoxide
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
ROG = reactive organic gas
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_X = sulfur oxides

The results shown in Table D indicate the proposed project would not exceed the significance criteria for daily ROG, NO_X, CO, SO_X, PM_{10}, or $PM_{2.5}$ emissions. Therefore, operation of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

Long-Term Microscale (CO Hot Spot) Analysis. Vehicular trips associated with the proposed project would contribute to congestion at intersections and along roadway segments in the vicinity of the proposed project site. Localized air quality impacts would occur when emissions from vehicular traffic increase as a result of the proposed project. The primary mobile-source pollutant of local concern is CO, a direct function of vehicle idling time and, thus, of traffic flow conditions. CO transport is extremely limited; under normal meteorological conditions, it disperses rapidly with distance from the source. However, under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels, affecting local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients).

Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service or with extremely high traffic volumes. In areas with high ambient background CO concentrations, modeling is recommended to determine a project's effect on local CO levels.

An assessment of project-related impacts on localized ambient air quality requires that future ambient air quality levels be projected. Existing CO concentrations in Tulare County are not available. The highest CO concentrations would normally occur during peak traffic hours; hence, CO impacts calculated under peak traffic conditions represent a worst-case analysis. Reduced speeds and vehicular congestion at intersections result in increased CO emissions.

As described in the Project Description section, the proposed project is estimated to generate 883 average daily trips[1]. Therefore, given the extremely low level of CO concentrations in the project area and the lack of traffic impacts at any intersections, project-related vehicles are not expected to result in CO concentrations exceeding the State or federal CO standards. No CO hot spots would occur, and the project would not result in any project-related impacts on CO concentrations.

Health Risk on Nearby Sensitive Receptors

Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter. The project site is surrounded primarily by retail and commercial uses. The closest sensitive receptors to the project site include a multifamily residential building located east of the project site across Alta Avenue at approximately 450 feet.

Construction of the proposed project may expose surrounding sensitive receptors to airborne particulates, as well as a small quantity of construction equipment pollutants (i.e., usually diesel-fueled vehicles and equipment). However, construction contractors would be required to implement RCM AIR-1. Construction activities associated with the proposed project would occur over a short-timeframe, under 14 months, and therefore would expose potential sensitive receptors to emissions associated with construction activities for a limited duration. Construction emissions would be temporary in nature and limited to the immediate area surrounding the construction site. As identified above, sensitive receptors are located over 450 feet to the east of the proposed project site and across Alta Avenue; therefore, this distance is sufficient that particulate matter would settle prior to reaching the nearest sensitive receptors. In addition, as shown in Table C, construction emissions associated with the proposed project would not exceed the SJVAPCD's thresholds for ROG, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$ emissions. Therefore, with implementation of RCM AIR-1,

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1 Crawford & Bowen Planning, Inc. 2024. *Dinuba Apartments Trip Generation.* April.

project construction pollutant emissions would be below the SJVAPCD significance thresholds and are not expected to result in the exposure of sensitive receptors to substantial pollutant concentrations.

The proposed project would include the construction of a 126-unit multifamily residential development. As identified in Table D, project operational emissions of criteria pollutants would be below SJVAPCD significance thresholds; thus, they are not likely to have a significant impact on sensitive receptors. In addition, the proposed project would be required to implement District Rule 9510, Indirect Source Review (ISR). Implementation of Rule 9510 would reduce operational emissions of NO_X and PM_{10} by 33.3 percent and 50 percent, respectively. Compliance with SJVAPCD rules would further limit doses and exposures, reducing potential health risk related to gasoline vapors to a level that is not significant. Once the proposed project is constructed, the proposed project would not be a source of substantial emissions. Therefore, implementation of the proposed project would not result in new sources of TACs. Therefore, the project would not expose sensitive receptors to substantial levels of TACs.

Odors

The SJVAPCD addresses odor criteria within the GAMAQI. The district has not established a rule or standard regarding odor emissions, rather, the district has a nuisance rule: "Any project with the potential to frequently expose members of the public to objectionable odors should be deemed to have a significant impact."

During project construction, some odors may be present due to diesel exhaust. However, these odors would be temporary and limited to the construction period. The proposed uses are not anticipated to emit any objectionable odors. Any odors in general would be confined mainly to the project site and would readily dissipate. Therefore, the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Naturally Occurring Asbestos

The project is in Tulare County, which is among the counties found to have serpentine and ultramafic rock in their soils.[1] However, according to the California Geological Survey, no such rock has been identified in the project vicinity. When demolition is proposed during construction, the demolition of existing buildings may expose asbestos used in building materials. However, the proposed project would not involve any demolition or renovation as no current development exists on the project site. Therefore, the potential risk for naturally occurring asbestos during project construction is small and would not be significant.

Valley Fever

The closest sensitive receptors to the project site include a multifamily residential building located east of the project site across Alta Avenue at approximately 450 feet. Except under high wind conditions, this distance is sufficient that particulate matter would settle prior to reaching the

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1 California Department of Conservation (DOC). California Geological Survey. Asbestos. Website: https://www.conservation.ca.gov/cgs/minerals/mineral-hazards (accessed May 2024).

nearest sensitive receptor. In addition, crosswinds influenced by the adjacent roadways would help dissipate any particulate matter associated with the construction phase of the project. Therefore, any Valley fever spores suspended with the dust would not be anticipated to reach the sensitive receptors. However, during project construction, it is possible that workers could be exposed to Valley fever through fugitive dust. Dust control measures, consistent with SJVAPCD Regulation VIII, would reduce the exposure to the workers and sensitive receptors. Therefore, dust from the construction of the project is not anticipated to significantly add to the existing exposure of people to Valley fever.

Energy Use

This section discusses energy use resulting from implementation of the proposed project and evaluates whether the proposed project would result in the wasteful, inefficient, or unnecessary consumption of energy resources or conflict with any applicable plans for renewable energy and energy efficiency.

Construction

The anticipated construction schedule assumes that the proposed project would be built in approximately 14 months. Construction-specific phases were assessed for their energy consumption under each construction sub-phase: grading, site preparation, building construction, paving, and architectural coating activities.

Construction would require energy for the manufacture and transportation of construction materials, preparation of the site for grading and building activities, and construction of the building. All or most of this energy would be derived from nonrenewable resources. Petroleum fuels (e.g., diesel and gasoline) would be the primary sources of energy for these activities. However, construction activities are not anticipated to result in an inefficient use of energy as gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the project. Energy (i.e., fuel) usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources.

Operation

Energy use associated with the proposed project would consist of electricity and vehicle fuel use associated with project operations. The proposed project would not include natural gas, and no natural gas demand is anticipated during operation of the proposed project.

Table E shows the estimated potential increased electricity, gasoline, and diesel demand associated with the proposed project. The electricity and natural gas rates are from the CalEEMod analysis, while the gasoline and diesel rates are based on the traffic analysis in conjunction with USDOT fuel efficiency data and using the USEPA's fuel economy estimates for 2020 and the California diesel fuel economy estimates for 2021.

Table E: Estimated Annual Energy Use of Proposed Project

	Electricity Use (kWh per year)	Natural Gas Use (kBTU per year)	Gasoline (gallons per year)	Diesel (gallons per year)
Proposed Project	671,173	0.0	56,300	45,954

Source: Compiled by LSA (May 2024).
kBTU = thousand British thermal units
kWh = kilowatt hours

As shown in Table E, the estimated increase in electricity demand associated with the operation of the proposed project would be 671,173 kilowatt hours (kWh) per year. Total electricity consumption in Tulare County in 2022 was 4,957,696,254 kWh;[1] therefore, operation of the proposed project would negligibly increase the annual electricity consumption in Tulare County by approximately 0.01 percent.

In addition, the project would result in energy usage associated with motor vehicle gasoline to fuel project-related trips. As shown above in Table E, the proposed project would result in the consumption of 56,300 gallons of gasoline and 45,954 gallons of diesel per year. Based on fuel consumption obtained from EMFAC2021, approximately 197.1 million gallons of gasoline and approximately 65 million gallons of diesel will be consumed from vehicle trips in Tulare County in 2024. Therefore, vehicle trips associated with the proposed project would increase the annual fuel use in Tulare County by approximately 0.03 percent for gasoline fuel usage and approximately 0.1 percent for diesel fuel usage. The proposed project would result in fuel usage that is a small fraction of current annual fuel use in Tulare County, and fuel consumption associated with vehicle trips generated by project operations would not be considered inefficient, wasteful, or unnecessary in comparison to other similar developments in the region. Therefore, gasoline demand generated by vehicle trips associated with the proposed project would be a minimal fraction of gasoline and diesel fuel consumption in California.

Furthermore, the proposed project would be constructed using energy efficient modern building materials and construction practices, and the proposed project also would use new modern appliances and equipment, in accordance with the Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608). The expected energy consumption during construction and operation of the proposed project would be consistent with typical usage rates for residential uses; however, energy consumption is largely a function of personal choice and the physical structure and layout of buildings.

PG&E is the private utility that would supply the proposed project's electricity. In 2021, a total of 50 percent of PG&E's delivered electricity came from renewable sources, including solar, wind,

[1] CEC. 2022. Electricity Consumption by County. Website: www.ecdms.energy.ca.gov/elecbycounty.aspx (accessed May 2024).

geothermal, small hydroelectric, and various forms of bioenergy.[1] PG&E reached California's 2020 renewable energy goal in 2017 and is positioned to meet the State's 60 percent by 2030 renewable energy mandate set forth in SB 100. In addition, PG&E plans to continue to provide reliable service to its customers and upgrade its distribution systems as necessary to meet future demand. As such, the proposed project would not result in a potential significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation.

Conflict with or Obstruction of a State or Local Plan for Renewable Energy or Energy Efficiency

The CEC recently adopted the 2023 Integrated Energy Policy Report.[2] The 2023 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. The 2023 Integrated Energy Policy Report covers a broad range of topics, including decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecasts, and the California Energy Demand Forecast.

As indicated above, energy usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. In addition, energy usage associated with operation of the proposed project would be relatively small in comparison to the region's available energy sources, and energy impacts would be negligible at the regional level. Because California's energy conservation planning actions are conducted at a regional level, and because the project's total impact on regional energy supplies would be minor, the proposed project would not conflict with or obstruct California's energy conservation plans as described in the CEC's 2023 Integrated Energy Policy Report. Therefore, the proposed project would not lead to new or substantially more severe energy impacts.

Greenhouse Gas Emission Impacts

Generation of Greenhouse Gas Emissions

The following sections describe the proposed project's construction- and operation-related GHG impacts and consistency with applicable GHG reduction plans.

Construction Greenhouse Gas Emissions. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the

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1 PG&E. 2021. *Exploring Clean Energy Solutions*. Website: https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page?WT.mc_id=Vanity_cleanenergy (accessed May 2024).

2 CEC. 2023. *2023 Integrated Energy Policy Report*. California Energy Commission. Docket Number: 23-IEPR-01.

fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The SJVAPCD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction. Using CalEEMod, it is estimated that the annual emissions associated with construction of the proposed project would be approximately 406.5 metric tons of CO_2e per year. Construction GHG emissions were amortized over the life of the project (assumed to be 30 years) and added to the operational emissions. When annualized over the life of the project, amortized construction emissions would be approximately 13.6 MT CO_2e per year.

Operational Greenhouse Gas Emissions. Long-term GHG emissions are typically generated from mobile sources (e.g., vehicle and truck trips), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, waste sources (land filling and waste disposal), and water sources (water supply and conveyance, treatment, and distribution). Mobile-source GHG emissions would include project-generated vehicle trips to and from the project. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions would be generated at off-site utility providers as a result of increased electricity demand generated by the project. Waste source emissions generated by the proposed project include energy generated by land filling and other methods of disposal related to transporting and managing project generated waste. In addition, water source emissions associated with the proposed project are generated by water supply and conveyance, water treatment, water distribution, and wastewater treatment.

Following guidance from the SJVAPCD, GHG emissions for operation of the project were calculated using CalEEMod. Based on the analysis results, summarized in Table F, the proposed project would result in emissions of approximately 776.1 MT CO_2e per year. These estimated emissions are provided for informational purposes, and the significance of the proposed project is further analyzed below. CalEEMod output sheets are attached.

Table F: Greenhouse Gas Emissions

Emission Type	Operational Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Mobile Sources	645.8	<0.1	<0.1	659.6
Area Sources	1.6	<0.1	<0.1	1.6
Energy Sources	62.1	<0.1	<0.1	62.7
Water Sources	3.9	0.2	<0.1	9.5
Waste Sources	8.3	0.8	0.0	29.1
Amortized Construction Emissions				13.6
Total Operational Emissions				**776.1**

Source: Compiled by LSA (May 2024).

CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
N_2O = nitrous oxide

As discussed, the SJVAPCD has not established a numeric threshold for GHG emissions. The significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds or consistency with a regional GHG reduction plan (such as a Climate Action Plan). Neither the City nor the SJVAPCD has developed or adopted numeric GHG significance thresholds. Therefore, the proposed project was analyzed for consistency with the 2022 Scoping Plan.

The 2022 Scoping Plan includes key project attributes that reduce operational GHG emissions in Appendix D, Local Actions[1], of the 2022 Scoping Plan. As discussed in Appendix D of the 2022 Scoping Plan, absent consistency with an adequate, geographically specific GHG reduction plan such as a CEQA-qualified CAP, the first approach the State recommends for determining whether a proposed residential or mixed-use residential development would align with the State's climate goals is to examine whether the project includes key project attributes that reduce operational GHG emissions.

The project's consistency with key project attributes from the 2022 Scoping Plan that would be applicable to residential and mixed-use development is shown in Table G.

Residential and mixed-use projects that have all of the key project attributes as outlined in Table G would be considered to accommodate growth in a manner consistent with State GHG reduction and equity prioritization goals as outlined in the 2022 Scoping Plan.

The proposed project would be consistent with the 2022 Scoping Plan key residential and mixed-use project attributes related to EV charging requirements and building electrification. Therefore, the proposed project would be consistent with all project attributes in the 2022 Scoping Plan GHG emission thresholds. As such, the proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Consistency with Greenhouse Gas Reduction Plans

As demonstrated in the preceeding section, the proposed project would be consistent with the 2022 Scoping Plan key project attributes for residential and mixed-use projects.

The proposed project is further analyzed for consistency with the goals of the 2022 Scoping Plan and Tulare's RTP.

2022 Scoping Plan. The following discussion evaluates the proposed project according to the goals of the 2022 Scoping Plan, EO B-30-15, SB 32, and AB 197.

EO B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[2] to reflect the 2030 target set by EO B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing

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[1] CARB. 2022. *2022 Scoping Plan Appendix D Local Actions.* November. Website: https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-appendix-d-local-actions.pdf (accessed May 2024).

[2] CARB. 2017. *California's 2017 Climate Change Scoping Plan*. November.

Table G: Project Consistency with the 2022 Scoping Plan Key Residential and Mixed-Use Project Attributes that Reduce GHGs

Priority Areas	Key Project Attribute	Project Consistency
Transportation Electrification	Provides EV charging infrastructure that, at minimum, meets the most ambitious voluntary standard in the California Green Building Standards Code at the time of project approval.	***Consistent.*** CALGreen requires provision of infrastructure to accommodate EV chargers. The proposed project would provide electric vehicle charging to comply with the CALGreen code, which requires 10 percent of the total parking spaces to be equipped with Level 2 EV chargers and that at least half of the required EV chargers be equipped with J17772 connectors. Therefore, the proposed project would be consistent with this key project attribute.
VMT Reduction	Is located on infill sites that are surrounded by existing urban uses and reuses or redevelops previously undeveloped or underutilized land that is presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer).	***Consistent***. The project site is located in an area with a mix of land uses, including residential and commercial, uses that are presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer). Therefore, the proposed project would be consistent with this key project attribute.
	Does not result in the loss or conversion of natural and working lands.	***Consistent.*** The project site is not zoned for agricultural uses. The State Department of Conservation classifies the project site as Non-Enrolled Land. The project site is not located on land that is designated as Prime Farmland or Farmland of State Importance. In addition, the project site is currently vacant and is not zoned for agricultural uses. As such, the proposed project would be consistent with this key project attribute.
	Consists of transit-supportive densities (minimum of 20 residential dwelling units per acre) or Is in proximity to existing transit stops (within a half mile), or satisfies more detailed and stringent criteria specified in the region's SCS.	***Consistent.*** The proposed project would include the construction of 126 multifamily units on a 250,568 sq ft (5.75 acres) project site. Therefore, the proposed project would result in 21 residential dwelling units per acre. In addition, the project site is located within 0.5 mile of a transit stop. The proposed project would also provide pedestrian infrastructure connecting to neighboring uses. As such, the project would promote initiatives to reduce vehicle trips and VMT and would increase the use of alternate means of transportation. As such, the proposed project would be consistent with this key project attribute.
	Reduces parking requirements by: eliminating parking requirements or including maximum allowable parking ratios (i.e., the ratio of parking spaces to residential units or square feet); or providing residential parking supply at a ratio of less than one parking space per dwelling unit; or for multifamily residential development, requiring parking costs to be unbundled from costs to rent or own a residential unit.	***Consistent.*** The proposed project would consist of 126 multifamily units and would provide 295 parking spaces throughout the project site. Based on the proposed uses when compared to the number of parking spaces, the proposed project would not include reduced parking. However, future tenants would be able to implement unbundled parking costs, as feasible. Moreover, the project site is located within 0.5 mile of a transit stop. The proposed project would also provide pedestrian infrastructure connecting to neighboring uses. As such, the project would promote initiatives to reduce vehicle trips and VMT and would increase the use of alternate means of

Table G: Project Consistency with the 2022 Scoping Plan Key Residential and Mixed-Use Project Attributes that Reduce GHGs

Priority Areas	Key Project Attribute	Project Consistency
		transportation. Although the proposed project would not have reduced parking, it would still be consistent with the intent of this measure for reducing VMT.
	At least 20 percent of units included are affordable to lower-income residents.	***Consistent.*** The proposed project would not include affordable residential units. However, the proposed project would include residential units that would be in close proximity to commercial uses and would allow residents to live within walking distance to the commercial zones. Although the proposed project would not include affordable housing, the proposed project would provide needed multifamily housing. Therefore, the proposed project would be consistent with this key project attribute.
	Results in no net loss of existing affordable units.	***Consistent.*** The proposed project would not result in the removal of any existing residential units. As such, the proposed project would be consistent with this key project attribute.
Building Decarbonization	Uses all-electric appliances without any natural gas connections and does not use propane or other fossil fuels for space heating, water heating, or indoor cooking.	***Consistent.*** The proposed project would be consistent with State building code requirements as Title 24 advances to implement the building decarbonization goals from the 2022 Scoping Plan. As such, the proposed project would be consistent with this key project attribute.

Source: Compiled by LSA (May 2024).
EV = electric vehicle
SCS = Sustainable Communities Strategy
sq ft = square foot
VMT = vehicle miles traveled.

climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. SB 32 builds on AB 32 and keeps California on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

In addition, the 2022 Scoping Plan assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

The 2022 Scoping Plan focuses on building clean energy production and distribution infrastructure for a carbon-neutral future, including transitioning existing energy production and transmission infrastructure to produce zero-carbon electricity and hydrogen, and utilizing biogas resulting from wildfire management or landfill and dairy operations, among other substitutes. The 2022 Scoping Plan states that in almost all sectors, electrification will play an important role. The 2022 Scoping Plan evaluates clean energy and technology options and the transition away from fossil fuels, including adding four times the solar and wind capacity by 2045 and about 1,700 times the amount of current hydrogen supply. As discussed in the 2022 Scoping Plan, EO N-79-20 requires that all new passenger vehicles sold in California will be zero-emission by 2035, and all other fleets will have transitioned to zero-emission as fully possible by 2045, which will reduce the percentage of fossil fuel combustion vehicles.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings. The proposed project would not be powered by natural gas, and no natural gas demand is anticipated during construction or operation of the proposed project. The elimination of natural gas in new development would help projects implement their "fair share" of achieving long-term 2045 carbon neutrality consistent with State goals. As such, if a project does not utilize natural gas, a lead agency can conclude that it would be consistent with achieving the 2045 neutrality goal and will not have a cumulative considerable impact on climate change.[1] In addition, the proposed project would be required to comply with the latest Title 24 standards of the CCR, established by the CEC, regarding energy conservation and green building standards. Therefore, the proposed project would comply with applicable energy measures.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. The project would comply with the CALGreen Code, which includes a variety of different measures, including the reduction of wastewater and water use. In addition, the proposed project would be required to comply with the California Model Water Efficient Landscape Ordinance. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. Specific regional emission targets for transportation emissions would not directly apply to the proposed project. The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulting in a 3 percent decrease in average vehicle emissions for all vehicles by 2020. Vehicles traveling to the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. Therefore, the proposed project would not conflict with the identified transportation and motor vehicle measures.

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1 Bay Area Air Quality Management District (BAAQMD). 2022. *Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans.* April. Website: Microsoft Word - FINAL CEQA Thresholds Report for Climate Impacts 03_30_22 revisions with tracked changes (baaqmd.gov) (accessed May 2024).

Tulare 2022 RTP/SCS. The TCAG RTP/SCS reflects transportation planning for Tulare County through 2046. The vision, goals, and policies in the 2022 RTP are intended to serve as the foundation for both short- and long-term planning and guide implementation activities. The core vision in the 2022 RTP is to create a region of diverse, safe, resilient, and accessible transportation options that improve the quality of life for all residents by fostering sustainability, equity, a vibrant economy, clean air, and healthy communities. The 2022 RTP contains transportation projects to help more efficiently distribute population, housing, and employment growth, as well as forecast development that is generally consistent with regional-level general plan data. The actions in the 2022 RTP address all transportation modes (highways, local streets and roads, mass transportation, rail, bicycle, aviation facilities and services) and consists of short- and long-term activities that address regional transportation needs. While the actions are organized by the five key policy areas, many of them support multiple goals and policies. Some actions are intended to support the Sustainable Communities Strategy and reduce GHG emissions directly, while others are focused on the RTP's broader goals. The 2022 RTP does not require that local General Plans, Specific Plans, or zoning be consistent with the 2022 RTP, but provides incentives for consistency for governments and developers.

The proposed project would not interfere with the TCAG's ability to achieve the region's GHG reductions. Furthermore, the proposed project is not regionally significant per *State CEQA Guidelines* Section 15206 and as such, it would not conflict with the 2022 RTP targets since those targets were established and are applicable on a regional level. The proposed project would include the construction of 126 multifamily residential units and associated site improvements. As such, the proposed project land uses would be consistent with the growth assumptions used in the 2022 RTP. Therefore, it is anticipated that implementation of the proposed project would not interfere with the TCAG's ability to implement the regional strategies outlined in the 2022 RTP. The proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals and would be consistent with applicable plans and programs designed to reduce GHG emissions. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

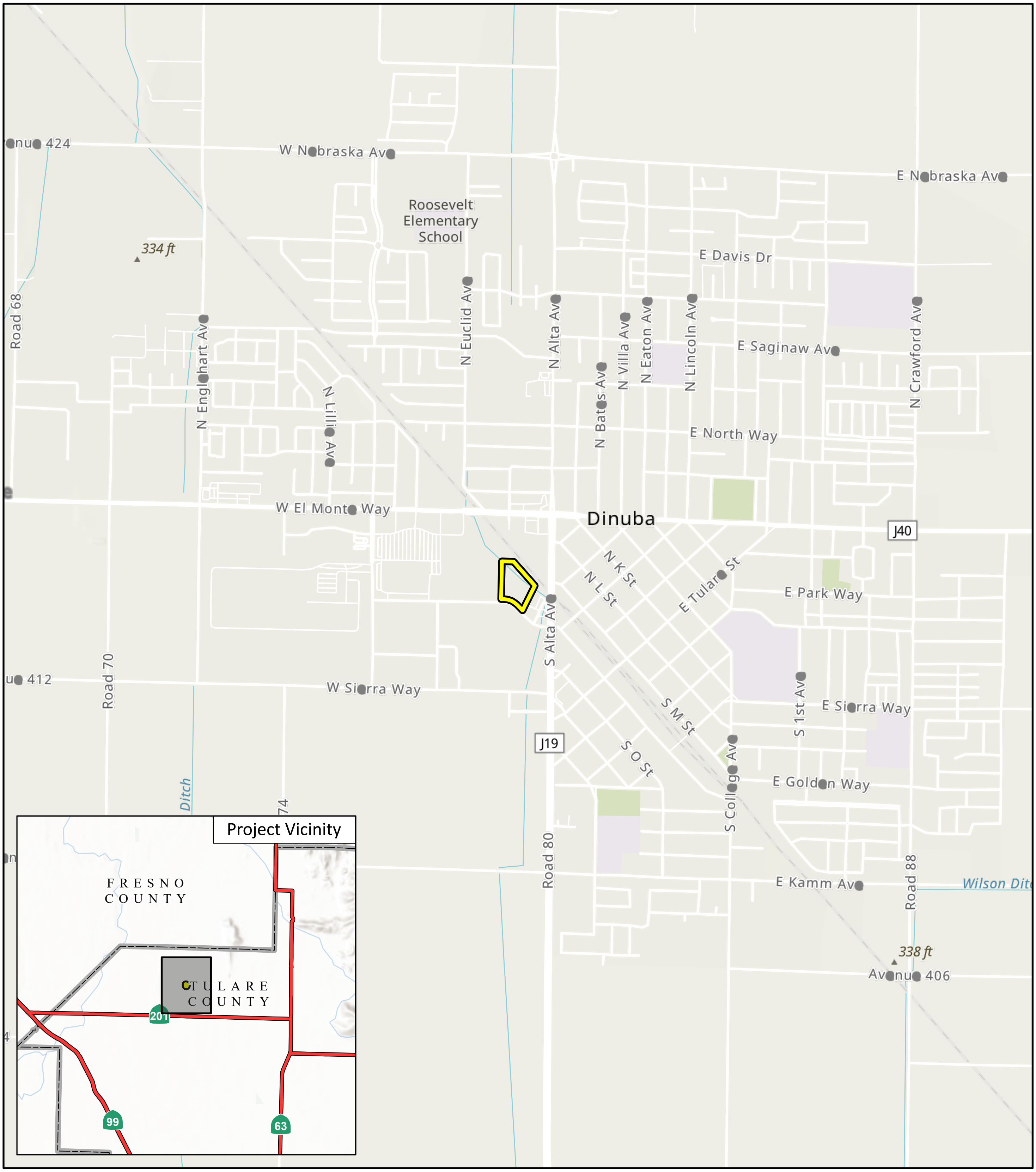
CONCLUSION

Based on the analysis presented above, with implementation of RCM AIR-1, construction and operational activities associated with the proposed project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. In addition, the proposed project is not expected to produce significant emissions that would affect nearby sensitive receptors. The proposed project would also not result in objectionable odors affecting a substantial number of people. The project would also not result in the emission of substantial GHG emissions. Additionally, the project would not conflict with the State's GHG emissions reductions objectives embodied in the 2022 Scoping Plan, Executive Order B-30-15, SB 32, and AB 197. Therefore, the proposed project's incremental contribution to cumulative GHG emissions would not be cumulatively considerable.

Attachments: A: Figures
B: CalEEMod Outputs

ATTACHMENT A

FIGURES



Project Location

FIGURE 1

LSA

0 1000 2000
FEET

SOURCE: Esri Topo 2024

Dinuba Apartments Projects

Project Location

I:\20241685\GIS\Pro\Dinuba Apartments Projects\Dinuba Apartments Projects.aprx (5/23/2024)

FIGURE 2

0 45 90
FEET

SOURCE: Klassen Corp.

Dinuba Apartments Projects

Site Plan

I:\20241685\G\Site_Plan.ai (5/23/2024)

ATTACHMENT B

CALEEMOD OUTPUTS

Dinuba Apartments Project Custom Report

Table of Contents

8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	Dinuba Apartments Project
Construction Start Date	7/1/2024
Operational Year	2025
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	1.90
Precipitation (days)	31.4
Location	36.54341016323886, -119.39760143295369
County	Tulare
City	Dinuba
Air District	San Joaquin Valley APCD
Air Basin	San Joaquin Valley
TAZ	2777
EDFZ	5
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Southern California Gas
App Version	2022.1.1.22

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Apartments Low Rise	126	Dwelling Unit	4.39	133,560	57,767	—	426	—
Parking Lot	295	Space	1.36	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	42.8	39.9	29.2	0.05	1.12	7.76	8.88	1.02	3.96	4.98	—	5,404	5,404	0.22	0.09	5,424
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.08	19.7	18.2	0.03	0.69	0.57	1.26	0.65	0.14	0.78	—	3,187	3,187	0.15	0.09	3,217
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.83	8.93	8.15	0.01	0.32	0.49	0.71	0.30	0.21	0.42	—	1,423	1,423	0.06	0.04	1,436
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.52	1.63	1.49	< 0.005	0.06	0.09	0.13	0.05	0.04	0.08	—	236	236	0.01	0.01	238

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.17	39.9	29.2	0.05	1.12	7.76	8.88	1.02	3.96	4.98	—	5,404	5,404	0.22	0.09	5,424
2025	42.8	19.6	18.8	0.03	0.69	0.57	1.26	0.65	0.14	0.78	—	3,235	3,235	0.14	0.09	3,266
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	1.08	19.7	18.2	0.03	0.69	0.57	1.26	0.65	0.14	0.78	—	3,187	3,187	0.15	0.09	3,217
2025	1.05	19.6	17.8	0.03	0.69	0.57	1.26	0.65	0.14	0.78	—	3,172	3,172	0.14	0.09	3,201
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.31	6.64	5.77	0.01	0.22	0.49	0.71	0.21	0.21	0.42	—	1,011	1,011	0.04	0.02	1,019
2025	2.83	8.93	8.15	0.01	0.32	0.24	0.56	0.30	0.06	0.36	—	1,423	1,423	0.06	0.04	1,436
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.06	1.21	1.05	< 0.005	0.04	0.09	0.13	0.04	0.04	0.08	—	167	167	0.01	< 0.005	169
2025	0.52	1.63	1.49	< 0.005	0.06	0.04	0.10	0.05	0.01	0.07	—	236	236	0.01	0.01	238

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	7.53	2.76	28.8	0.04	0.04	3.23	3.27	0.04	0.82	0.86	60.5	4,554	4,614	6.37	0.26	4,868
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.39	3.09	19.4	0.04	0.04	3.23	3.27	0.04	0.82	0.86	60.5	4,191	4,252	6.41	0.28	4,496

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.78	2.93	22.6	0.04	0.04	3.16	3.20	0.04	0.80	0.84	60.5	4,298	4,359	6.39	0.27	4,607
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.24	0.54	4.13	0.01	0.01	0.58	0.58	0.01	0.15	0.15	10.0	712	722	1.06	0.04	763

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.79	2.69	21.6	0.04	0.04	3.23	3.27	0.04	0.82	0.86	—	4,146	4,146	0.23	0.23	4,236
Area	3.74	0.07	7.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	19.1	19.1	< 0.005	< 0.005	19.2
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	375	375	0.06	0.01	379
Water	—	—	—	—	—	—	—	—	—	—	10.3	13.2	23.5	1.06	0.03	57.4
Waste	—	—	—	—	—	—	—	—	—	—	50.2	0.00	50.2	5.02	0.00	176
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.96
Total	7.53	2.76	28.8	0.04	0.04	3.23	3.27	0.04	0.82	0.86	60.5	4,554	4,614	6.37	0.26	4,868
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.29	3.09	19.4	0.04	0.04	3.23	3.27	0.04	0.82	0.86	—	3,803	3,803	0.27	0.25	3,884
Area	3.10	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
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	375	375	0.06	0.01	379
Water	—	—	—	—	—	—	—	—	—	—	10.3	13.2	23.5	1.06	0.03	57.4
Waste	—	—	—	—	—	—	—	—	—	—	50.2	0.00	50.2	5.02	0.00	176
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.96

Total	6.39	3.09	19.4	0.04	0.04	3.23	3.27	0.04	0.82	0.86	60.5	4,191	4,252	6.41	0.28	4,496
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.36	2.90	19.1	0.04	0.04	3.16	3.20	0.04	0.80	0.84	—	3,901	3,901	0.25	0.24	3,984
Area	3.41	0.03	3.52	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	9.43	9.43	< 0.005	< 0.005	9.46
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	375	375	0.06	0.01	379
Water	—	—	—	—	—	—	—	—	—	—	10.3	13.2	23.5	1.06	0.03	57.4
Waste	—	—	—	—	—	—	—	—	—	—	50.2	0.00	50.2	5.02	0.00	176
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.96
Total	6.78	2.93	22.6	0.04	0.04	3.16	3.20	0.04	0.80	0.84	60.5	4,298	4,359	6.39	0.27	4,607
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.61	0.53	3.49	0.01	0.01	0.58	0.58	0.01	0.15	0.15	—	646	646	0.04	0.04	660
Area	0.62	0.01	0.64	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.56	1.56	< 0.005	< 0.005	1.57
Energy	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	62.1	62.1	0.01	< 0.005	62.7
Water	—	—	—	—	—	—	—	—	—	—	1.70	2.18	3.88	0.17	< 0.005	9.50
Waste	—	—	—	—	—	—	—	—	—	—	8.32	0.00	8.32	0.83	0.00	29.1
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.16
Total	1.24	0.54	4.13	0.01	0.01	0.58	0.58	0.01	0.15	0.15	10.0	712	722	1.06	0.04	763

3. Construction Emissions Details

3.1. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.07	39.9	28.3	0.05	1.12	—	1.12	1.02	—	1.02	—	5,296	5,296	0.21	0.04	5,314
Dust From Material Movement	—	—	—	—	—	7.67	7.67	—	3.94	3.94	—	—	—	—	—	—
Onsite truck	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	1.09	0.78	< 0.005	0.03	—	0.03	0.03	—	0.03	—	145	145	0.01	< 0.005	146
Dust From Material Movement	—	—	—	—	—	0.21	0.21	—	0.11	0.11	—	—	—	—	—	—
Onsite truck	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.20	0.14	< 0.005	0.01	—	0.01	0.01	—	0.01	—	24.0	24.0	< 0.005	< 0.005	24.1
Dust From Material Movement	—	—	—	—	—	0.04	0.04	—	0.02	0.02	—	—	—	—	—	—
Onsite truck	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.06	0.91	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	108	108	0.01	< 0.005	110
Vendor	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
Hauling	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

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.71	2.71	< 0.005	< 0.005	2.76
Vendor	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
Hauling	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.45	0.45	< 0.005	< 0.005	0.46
Vendor	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
Hauling	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

3.3. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.73	23.2	17.8	0.03	0.75	—	0.75	0.69	—	0.69	—	2,958	2,958	0.12	0.02	2,969
Dust From Material Movement	—	—	—	—	—	2.76	2.76	—	1.34	1.34	—	—	—	—	—	—
Onsite truck	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.04	1.27	0.97	< 0.005	0.04	—	0.04	0.04	—	0.04	—	162	162	0.01	< 0.005	163
Dust From Material Movement	—	—	—	—	—	0.15	0.15	—	0.07	0.07	—	—	—	—	—	—
Onsite truck	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.23	0.18	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.8	26.8	< 0.005	< 0.005	26.9
Dust From Material Movement	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—
Onsite truck	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.05	0.78	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	92.5	92.5	0.01	< 0.005	94.2
Vendor	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
Hauling	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.65	4.65	< 0.005	< 0.005	4.73
Vendor	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
Hauling	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	0.78

Vendor	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
Hauling	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

3.5. Building Construction (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	18.9	14.3	0.02	0.69	—	0.69	0.64	—	0.64	—	2,398	2,398	0.10	0.02	2,406
Onsite truck	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	18.9	14.3	0.02	0.69	—	0.69	0.64	—	0.64	—	2,398	2,398	0.10	0.02	2,406
Onsite truck	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	4.10	3.11	0.01	0.15	—	0.15	0.14	—	0.14	—	521	521	0.02	< 0.005	523
Onsite truck	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.75	0.57	< 0.005	0.03	—	0.03	0.03	—	0.03	—	86.2	86.2	< 0.005	< 0.005	86.5
Onsite truck	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

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.52	0.30	4.72	0.00	0.00	0.49	0.49	0.00	0.12	0.12	—	559	559	0.04	0.02	570
Vendor	0.01	0.43	0.16	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	294	294	0.01	0.04	309
Hauling	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.45	0.37	3.70	0.00	0.00	0.49	0.49	0.00	0.12	0.12	—	495	495	0.04	0.02	503
Vendor	0.01	0.46	0.16	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	295	295	0.01	0.04	308
Hauling	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.07	0.83	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	111	111	0.01	0.01	113
Vendor	< 0.005	0.10	0.03	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	0.01	—	64.0	64.0	< 0.005	0.01	67.0
Hauling	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.01	0.15	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	18.5	18.5	< 0.005	< 0.005	18.8
Vendor	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.6	10.6	< 0.005	< 0.005	11.1
Hauling	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

3.7. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.62	18.9	14.3	0.02	0.69	—	0.69	0.64	—	0.64	—	2,398	2,398	0.10	0.02	2,406
Onsite truck	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.62	18.9	14.3	0.02	0.69	—	0.69	0.64	—	0.64	—	2,398	2,398	0.10	0.02	2,406
Onsite truck	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	7.83	5.93	0.01	0.29	—	0.29	0.27	—	0.27	—	995	995	0.04	0.01	998
Onsite truck	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	1.43	1.08	< 0.005	0.05	—	0.05	0.05	—	0.05	—	165	165	0.01	< 0.005	165
Onsite truck	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.49	0.28	4.32	0.00	0.00	0.49	0.49	0.00	0.12	0.12	—	547	547	0.03	0.02	557
Vendor	0.01	0.41	0.15	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	289	289	0.01	0.04	303
Hauling	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.42	0.34	3.39	0.00	0.00	0.49	0.49	0.00	0.12	0.12	—	484	484	0.04	0.02	492

Vendor	0.01	0.43	0.15	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	290	290	0.01	0.04	303
Hauling	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
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.13	1.45	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	208	208	0.02	0.01	212
Vendor	< 0.005	0.18	0.06	< 0.005	< 0.005	0.03	0.03	< 0.005	0.01	0.01	—	120	120	< 0.005	0.02	126
Hauling	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.27	0.00	0.00	0.04	0.04	0.00	0.01	0.01	—	34.5	34.5	< 0.005	< 0.005	35.1
Vendor	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.9	19.9	< 0.005	< 0.005	20.8
Hauling	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

3.9. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.50	13.3	10.6	0.01	0.58	—	0.58	0.54	—	0.54	—	1,511	1,511	0.06	0.01	1,517
Paving	0.18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.03	0.73	0.58	< 0.005	0.03	—	0.03	0.03	—	0.03	—	82.8	82.8	< 0.005	< 0.005	83.1
Paving	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.13	0.11	< 0.005	0.01	—	0.01	0.01	—	0.01	—	13.7	13.7	< 0.005	< 0.005	13.8
Paving	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.05	0.71	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	90.5	90.5	0.01	< 0.005	92.2
Vendor	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
Hauling	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.03	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	4.55	4.55	< 0.005	< 0.005	4.63
Vendor	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
Hauling	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.75	0.75	< 0.005	< 0.005	0.77
Vendor	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
Hauling	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

3.11. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	1.09	0.96	< 0.005	0.07	—	0.07	0.06	—	0.06	—	134	134	0.01	< 0.005	134
Architectural Coatings	42.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.06	0.05	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	7.32	7.32	< 0.005	< 0.005	7.34
Architectural Coatings	2.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.21	1.21	< 0.005	< 0.005	1.22
Architectural Coatings	0.43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	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
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.06	0.86	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	109	109	0.01	< 0.005	111
Vendor	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
Hauling	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.51	5.51	< 0.005	< 0.005	5.60
Vendor	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
Hauling	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.91	0.91	< 0.005	< 0.005	0.93
Vendor	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
Hauling	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

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	3.79	2.69	21.6	0.04	0.04	3.23	3.27	0.04	0.82	0.86	—	4,146	4,146	0.23	0.23	4,236
Parking Lot	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
Total	3.79	2.69	21.6	0.04	0.04	3.23	3.27	0.04	0.82	0.86	—	4,146	4,146	0.23	0.23	4,236
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	3.29	3.09	19.4	0.04	0.04	3.23	3.27	0.04	0.82	0.86	—	3,803	3,803	0.27	0.25	3,884
Parking Lot	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
Total	3.29	3.09	19.4	0.04	0.04	3.23	3.27	0.04	0.82	0.86	—	3,803	3,803	0.27	0.25	3,884
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	0.61	0.53	3.49	0.01	0.01	0.58	0.58	0.01	0.15	0.15	—	646	646	0.04	0.04	660
Parking Lot	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
Total	0.61	0.53	3.49	0.01	0.01	0.58	0.58	0.01	0.15	0.15	—	646	646	0.04	0.04	660

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	346	346	0.06	0.01	350
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	29.3
Total	—	—	—	—	—	—	—	—	—	—	—	375	375	0.06	0.01	379
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	346	346	0.06	0.01	350
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	29.0	29.0	< 0.005	< 0.005	29.3
Total	—	—	—	—	—	—	—	—	—	—	—	375	375	0.06	0.01	379
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	57.3	57.3	0.01	< 0.005	57.9
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	4.80	4.80	< 0.005	< 0.005	4.85
Total	—	—	—	—	—	—	—	—	—	—	—	62.1	62.1	0.01	< 0.005	62.7

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Apartments	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
Parking Lot	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
Total	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
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	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
Parking Lot	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
Total	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	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
Parking Lot	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
Total	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

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	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

Consumer Products	2.86	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.64	0.07	7.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	19.1	19.1	< 0.005	< 0.005	19.2
Total	3.74	0.07	7.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	19.1	19.1	< 0.005	< 0.005	19.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	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
Consumer Products	2.86	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	3.10	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	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
Consumer Products	0.52	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.06	0.01	0.64	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.56	1.56	< 0.005	< 0.005	1.57
Total	0.62	0.01	0.64	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.56	1.56	< 0.005	< 0.005	1.57

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	10.3	13.2	23.5	1.06	0.03	57.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.3	13.2	23.5	1.06	0.03	57.4
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	10.3	13.2	23.5	1.06	0.03	57.4
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	10.3	13.2	23.5	1.06	0.03	57.4
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	1.70	2.18	3.88	0.17	< 0.005	9.50
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	1.70	2.18	3.88	0.17	< 0.005	9.50

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	50.2	0.00	50.2	5.02	0.00	176
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	50.2	0.00	50.2	5.02	0.00	176
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	50.2	0.00	50.2	5.02	0.00	176
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	50.2	0.00	50.2	5.02	0.00	176
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	8.32	0.00	8.32	0.83	0.00	29.1
Parking Lot	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	8.32	0.00	8.32	0.83	0.00	29.1

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.96
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.96
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.96
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.96
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Apartments Low Rise	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.16
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.16

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	7/30/2024	8/13/2024	5.00	10.0	—
Grading	Grading	8/14/2024	9/11/2024	5.00	20.0	—
Building Construction	Building Construction	9/12/2024	7/31/2025	5.00	230	—
Paving	Paving	8/1/2025	8/29/2025	5.00	20.0	—
Architectural Coating	Architectural Coating	8/30/2025	9/27/2025	5.00	20.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	Diesel	Tier 2	3.00	8.00	367	0.40
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Tier 2	4.00	8.00	84.0	0.37
Grading	Excavators	Diesel	Tier 2	1.00	8.00	36.0	0.38
Grading	Graders	Diesel	Tier 2	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Tier 2	1.00	8.00	367	0.40
Grading	Tractors/Loaders/Backhoes	Diesel	Tier 2	3.00	8.00	84.0	0.37
Building Construction	Cranes	Diesel	Tier 2	1.00	7.00	367	0.29
Building Construction	Forklifts	Diesel	Tier 2	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Tier 2	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Tier 2	3.00	7.00	84.0	0.37
Building Construction	Welders	Diesel	Tier 2	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Tier 2	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Tier 2	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Tier 2	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Tier 2	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Site Preparation	—	—	—	—

Site Preparation	Worker	17.5	7.70	LDA,LDT1,LDT2
Site Preparation	Vendor	—	6.80	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	15.0	7.70	LDA,LDT1,LDT2
Grading	Vendor	—	6.80	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	90.7	7.70	LDA,LDT1,LDT2
Building Construction	Vendor	13.5	6.80	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	7.70	LDA,LDT1,LDT2
Paving	Vendor	—	6.80	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	18.1	7.70	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	6.80	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	270,459	90,153	0.00	0.00	3,554

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	0.00	0.00	15.0	0.00	—
Grading	0.00	0.00	20.0	0.00	—
Paving	0.00	0.00	0.00	0.00	1.36

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt

Apartments Low Rise	—	0%
Parking Lot	1.36	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	204	0.03	< 0.005
2025	0.00	204	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Apartments Low Rise	883	883	883	322,390	4,539	4,539	4,539	1,656,912
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Apartments Low Rise	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0

No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
270459	90,153	0.00	0.00	3,554

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Apartments Low Rise	619,277	204	0.0330	0.0040	0.00
Parking Lot	51,896	204	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Apartments Low Rise	5,362,894	1,018,959
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Apartments Low Rise	93.2	—
Parking Lot	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Apartments Low Rise	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Apartments Low Rise	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

8. User Changes to Default Data

Screen	Justification
Land Use	Project site is 250,568 sq ft or 5.75 acres in size. Project would develop 126 multi family housing lots, including 57,767 sq ft of landscape area and 295 parking spaces
Construction: Construction Phases	No demolition. Default construction schedule.
Construction: Off-Road Equipment	Default construction equipment with Tier 2 engines
Operations: Vehicle Data	Based on the trip generation, the proposed project would generate approximately 883 ADT Trip rate = 883 ADT/ 126 units = 7.01
Operations: Hearths	No wood burning hearths
Operations: Energy Use	Proposed project would be designed to be all electric

Appendix B

CHRIS Cultural Resources Records Search

California
Historical
Resources
Information
System

Fresno
Kern
Kings
Madera
Tulare

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 72 DOB
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289
E-mail: ssjvic@csub.edu
Website: www.csub.edu/ssjvic

To: Emily Bowen
Crawford Bowen Planning, Inc.
113 N. Church Street, Suite 310
Visalia, CA 93291

Record Search 24-185

Date: May 1, 2024

Re: Dinuba Verma Apartments Residential Project

County: Tulare

Map(s): Reedley 7.5'

CULTURAL RESOURCES RECORDS SEARCH

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

The following are the results of a search of the cultural resource files at the Southern San Joaquin Valley Information Center. These files include known and recorded cultural resources sites, inventory and excavation reports filed with this office, and resources listed on the National Register of Historic Places, the OHP Built Environment Resources Directory, California State Historical Landmarks, California Register of Historical Resources, California Inventory of Historic Resources, and California Points of Historical Interest. Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the OHP are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area.

PRIOR CULTURAL RESOURCE STUDIES CONDUCTED WITHIN THE PROJECT AREA AND THE ONE-HALF MILE RADIUS

According to the information in our files, there are no previous cultural resource studies completed within the project area. There have been 5 cultural resource studies completed within the one-half mile radius: See the attached list.

KNOWN/RECORDED CULTURAL RESOURCES WITHIN THE PROJECT AREA AND THE ONE-HALF MILE RADIUS

According to the information in our files, there are no recorded resources within the project area. There are 5 recorded resources within the one-half mile radius: See the attached list. These consist of a historic era single-family properties, multi-family properties, commercial buildings, industrial buildings, ancillary building, canals, government buildings, religious buildings, a railroad, and a rail road crossing.

There are no recorded cultural resources within the project area or radius that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, for the California State Historic Landmarks.

COMMENTS AND RECOMMENDATIONS

We understand this project proposes to develop 126-unit multifamily residences in the city of Dinuba, CA. Additionally, we understand the proposed project area is a vacant field. Because this project area has not been previously studied for cultural resources, it is unknown if any are present. As such, prior to ground disturbance activities, we recommend a qualified, professional consultant conduct a field survey to determine if cultural resources are present. A list of qualified consultants can be found at www.chrisinfo.org.

We also recommend that you contact the Native American Heritage Commission in Sacramento. They will provide you with a current list of Native American individuals/organizations that can assist you with information regarding cultural resources that may not be included in the CHRIS Inventory and that may be of concern to the Native groups in the area. The Commission can consult their "Sacred Lands Inventory" file to determine what sacred resources, if any, exist within this project area and the way in which these resources might be managed. Finally, please consult with the lead agency on this project to determine if any other cultural resource investigation is required. If you need any additional information or have any questions or concerns, please contact our office at (661) 654-2289.

By:

Jeremy E David, Assistant Coordinator

Date: May 1, 2024

Please note that invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

SSJVIC Record Search 24-185

Reports in PA:	Reports in 0.5 Mile Buffer:	Resources in PA:	Resources in 0.5 mile buffer:
None	TU-00591	None	P-54-003603
	TU-01069		P-54-003620
	TU-01149		P-54-003621
	TU-01289		P-54-003622
	TU-01599		P-54-003623
			P-54-003624
			P-54-003625
			P-54-003626
			P-54-003627
			P-54-003628
			P-54-003629
			P-54-003630
			P-54-003631
			P-54-003632
			P-54-003633
			P-54-003634
			P-54-003635
			P-54-004626
			P-54-004895
			P-54-004899
			P-54-004920
			P-54-004921
			P-54-004922
			P-54-004923
			P-54-004924
			P-54-004925
			P-54-004926
			P-54-004927
			P-54-004928
			P-54-004929
			P-54-004930
			P-54-004931
			P-54-004932
			P-54-004933
			P-54-004934
			P-54-004935
			P-54-004936
			P-54-004937
			P-54-004938
			P-54-004939
			P-54-004940
			P-54-004941
			P-54-004946
			P-54-004947
			P-54-004948
			P-54-004949

Resources in 0.5 mile cont.:
P-54-004950
P-54-004951
P-54-004952
P-54-004953
P-54-004954
P-54-004955
P-54-004956
P-54-004957
P-54-004958
P-54-004959
P-54-004960
P-54-004961
P-54-004962
P-54-004963
P-54-004964
P-54-004965
P-54-004987
P-54-004988

Appendix C

Traffic Study

Project No: 524-43

TRAFFIC STUDY

MULTI-FAMILY RESIDENTIAL DEVELOPMENT
LOCATED SOUTH OF EL MONTE WAY AND NORTH OF SURABIAN WAY
ON THE WEST SIDE OF ALTA AVENUE
DINUBA, CA

Prepared for:
CRAWFORD & BOWEN PLANNING, INC.

June 2024

Prepared by:

RUETTGERS & SCHULER
CIVIL ENGINEERS

1800 30TH STREET, SUITE 260
BAKERSFIELD, CA 93301

Ian J. Parks, RCE 51825

REGISTERED PROFESSIONAL ENGINEER
IAN JEFFREY PARKS
No. C58155
Exp. 6-30-24
CIVIL
STATE OF CALIFORNIA

TABLE OF CONTENTS

INTRODUCTION

The purpose of this study is to evaluate the potential traffic impacts of a proposed residential development located south of El Monte Way, north of Surabian Way, on the west side of Alta Avenue in Dinuba, CA.

The proposed project consists of 126 multi-family dwelling units. A vicinity map and location map are presented in Figures 1 and 2, respectively.

A. Land Use, Site and Study Area Boundaries

The existing zoning is M-1 (Light Industrial) and the existing land use is Light Industrial and Commercial.

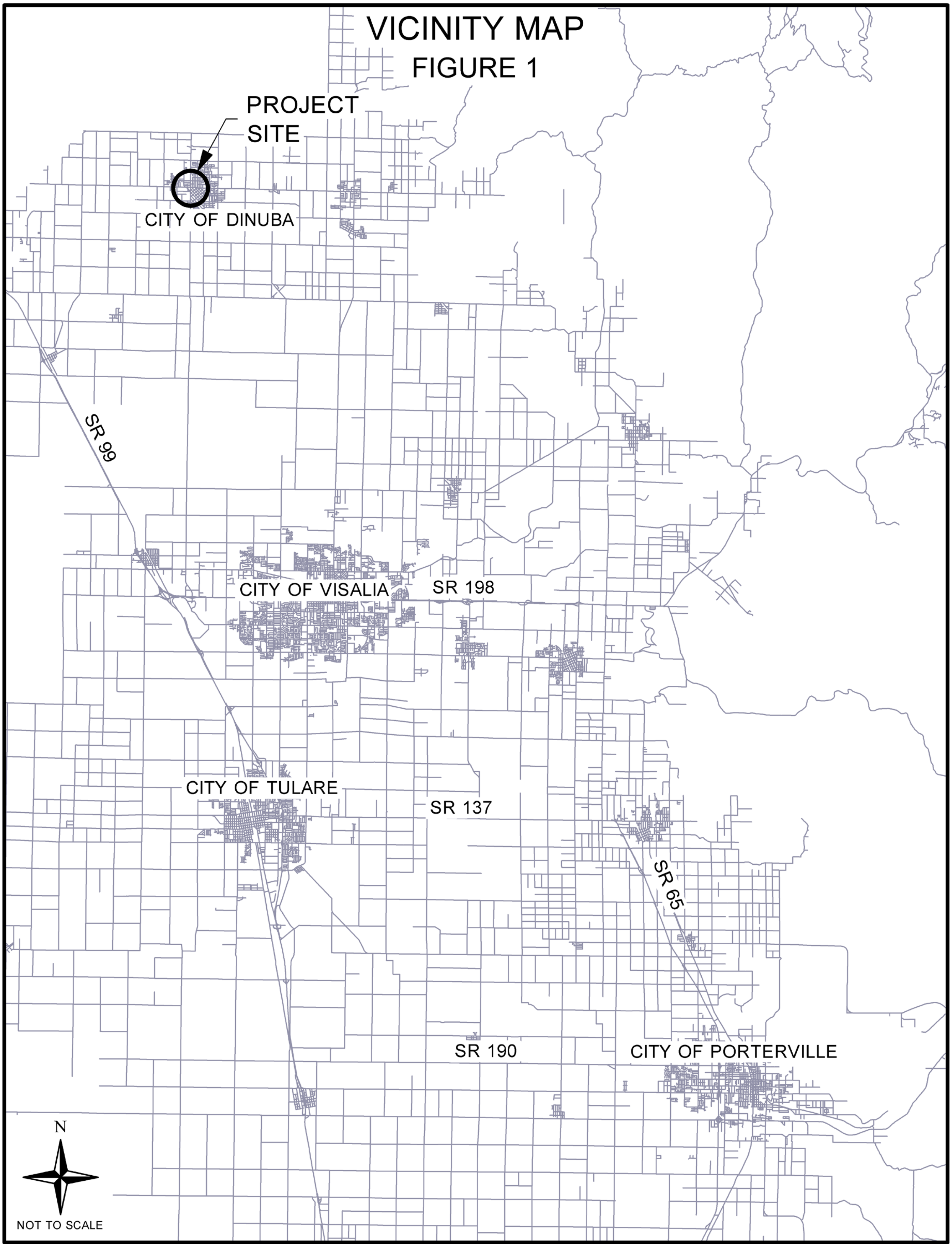
A total of four intersections are included in the study: three signalized and one stop controlled. The scope is based on a threshold of 50 project trips as defined in the Caltrans *Guide for the Preparation of Traffic Impact Studies*. Additionally, intersections were studied that were directly related to or adjacent to the project.

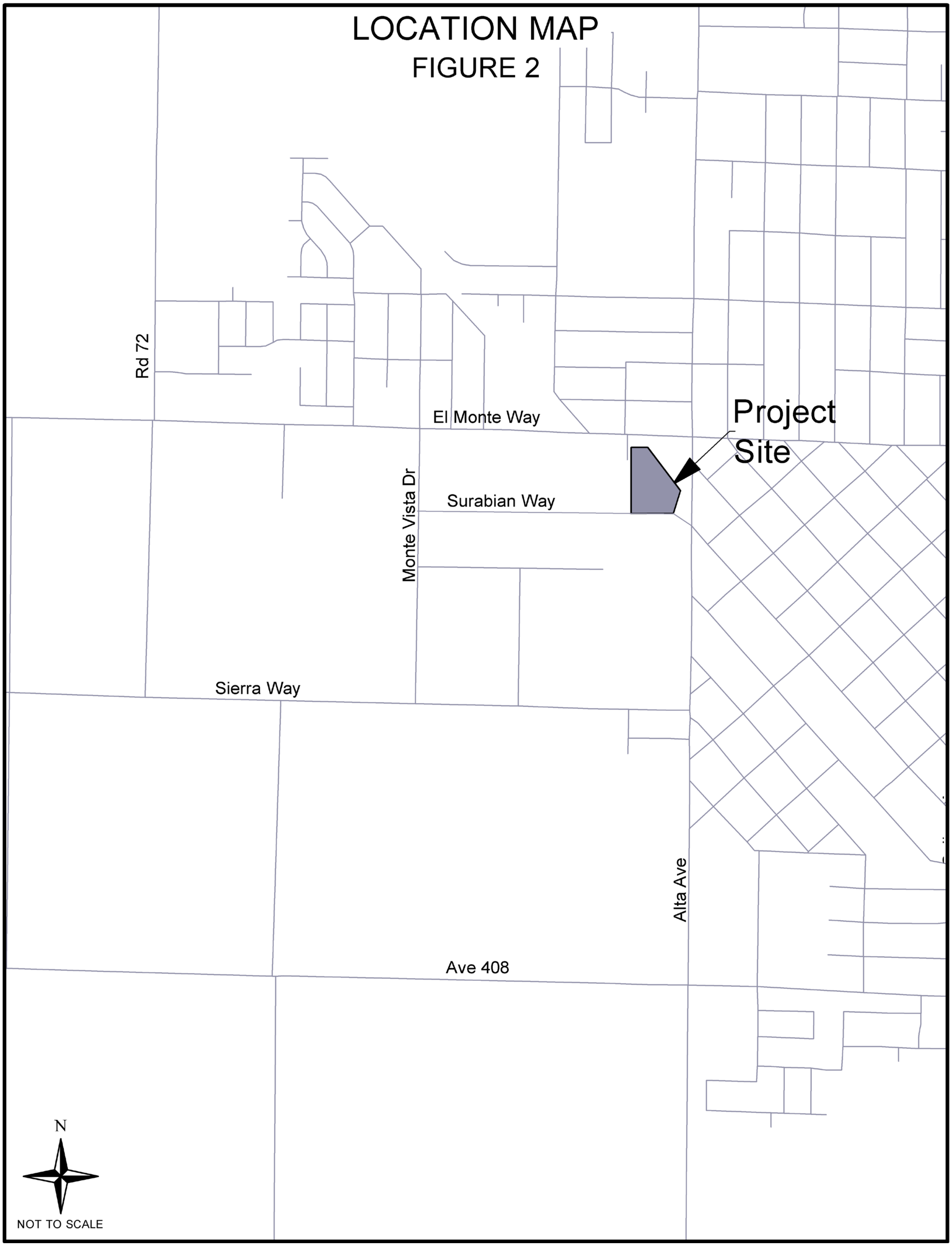
B. Existing Site Uses and Site Access

The site is currently vacant land. As currently planned, access to the proposed residential development would be provided along Surabian Way. A conceptual site plan is shown in Figure 3.

C. Existing Uses in Vicinity of the Site

Commercial land uses exist to the east, west, and north of the project. Vacant land exists immediately south of the project, with commercial land uses located generally south of the project. The project is bounded by Surabian Drive to the south.


VICINITY MAP
FIGURE 1
PROJECT SITE
CITY OF DINUBA
SR 99
CITY OF VISALIA
SR 198
CITY OF TULARE
SR 137
SR 65
SR 190
CITY OF PORTERVILLE
N
NOT TO SCALE


LOCATION MAP
FIGURE 2
Rd 72
El Monte Way
Monte Vista Dr
Surabian Way
Project Site
Sierra Way
Alta Ave
Ave 408
N
NOT TO SCALE

SITE PLAN
FIGURE 3

D. Roadway Descriptions

Alta Avenue is a north-south arterial that extends throughout the City of Dinuba. In the vicinity of the project, it exists as a four-lane roadway and provides access to residential, commercial, and agricultural land uses.

El Monte Way is an east-west arterial that extends west from Road 72 through the City of Orosi. In the vicinity of the project, it exists as a four-lane roadway with curb and gutter. El Monte Way provides access to commercial, residential, and agricultural land uses.

Monte Vista Dr is a north-south collector that extends from El Monte Way to Sierra Way in the City of Dinuba. In the vicinity of the project, it exists as a two-lane roadway and provides access to commercial and industrial land uses.

Surabian Drive is an east-west local roadway that extends from Alta Avenue to Monte Vista Drive in the City of Dinuba. In the vicinity of the project, it exists as a two-lane roadway and provides access to commercial land uses.

PROJECT TRIP GENERATION AND DESIGN HOUR VOLUMES

The trip generation and design hour volumes for the residential development were calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 11th Edition. The ADT, AM and PM peak hour rate equations, and peak hour directional splits for the ITE Land Use Code 220 (Multi-Family Housing) were used to estimate the project traffic.

Table 1
Project Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
220	Multifamily Housing (Low Rise)	126 Dwelling Units	eq	883	eq	24% 15	76% 47	eq	63% 47	37% 28

TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution in Table 2 represents the most likely travel routes for traffic accessing the project. Project traffic distribution was estimated based on a review of the potential draw from population centers within the region and the types of land uses involved.

Table 2
Project Trip Distribution

Direction	Percent
North	35
East	25
South	25
West	15

EXISTING AND FUTURE TRAFFIC

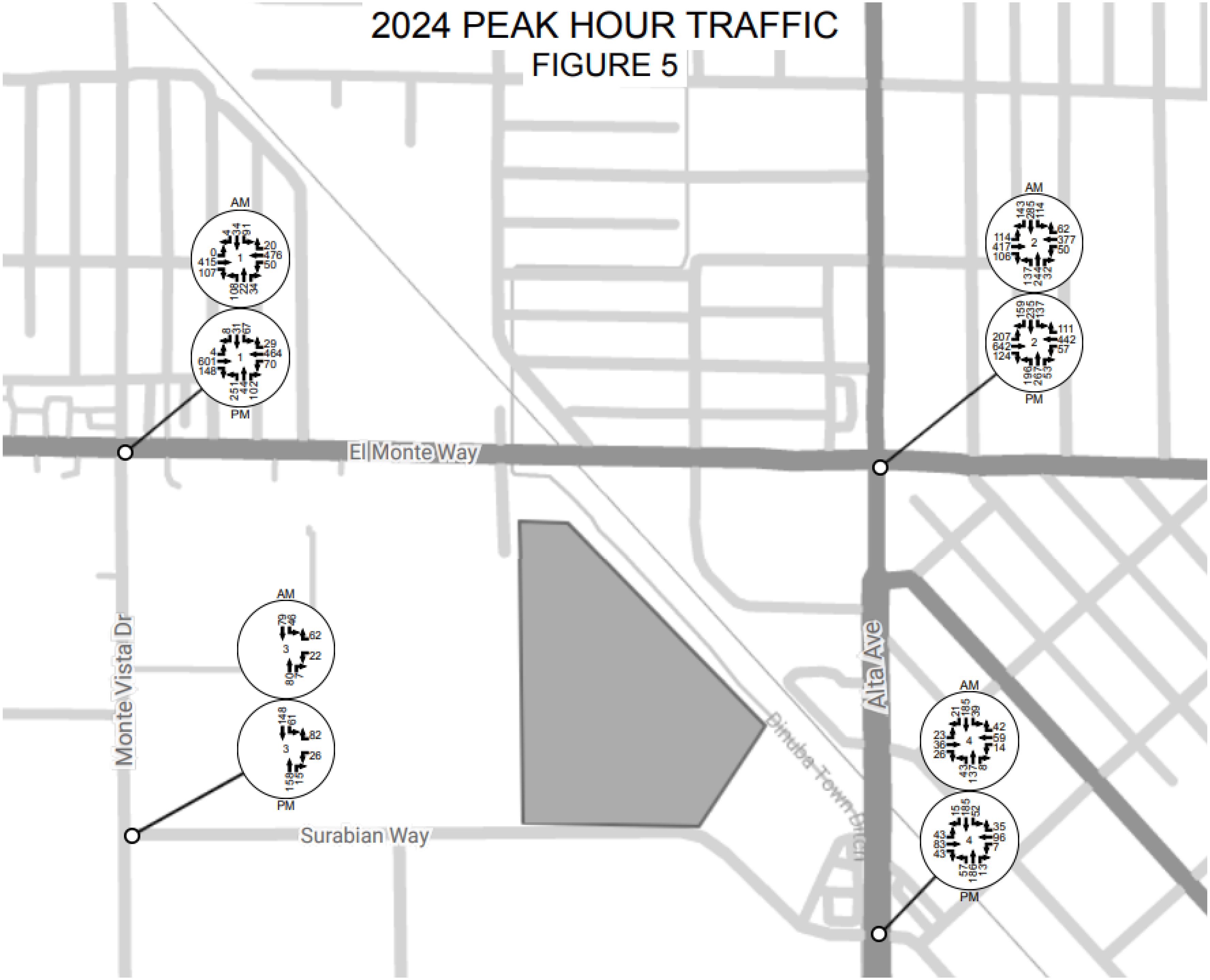
Weekday peak hour turning movements were counted at the following intersections in May 2024 (see Appendix for count data).

Traffic counts were conducted between the hours 6:00 to 8:00 AM and 4:00 to 6:00 PM and are shown in Figure 5. Existing + Project peak hour volumes are shown in Figure 6.

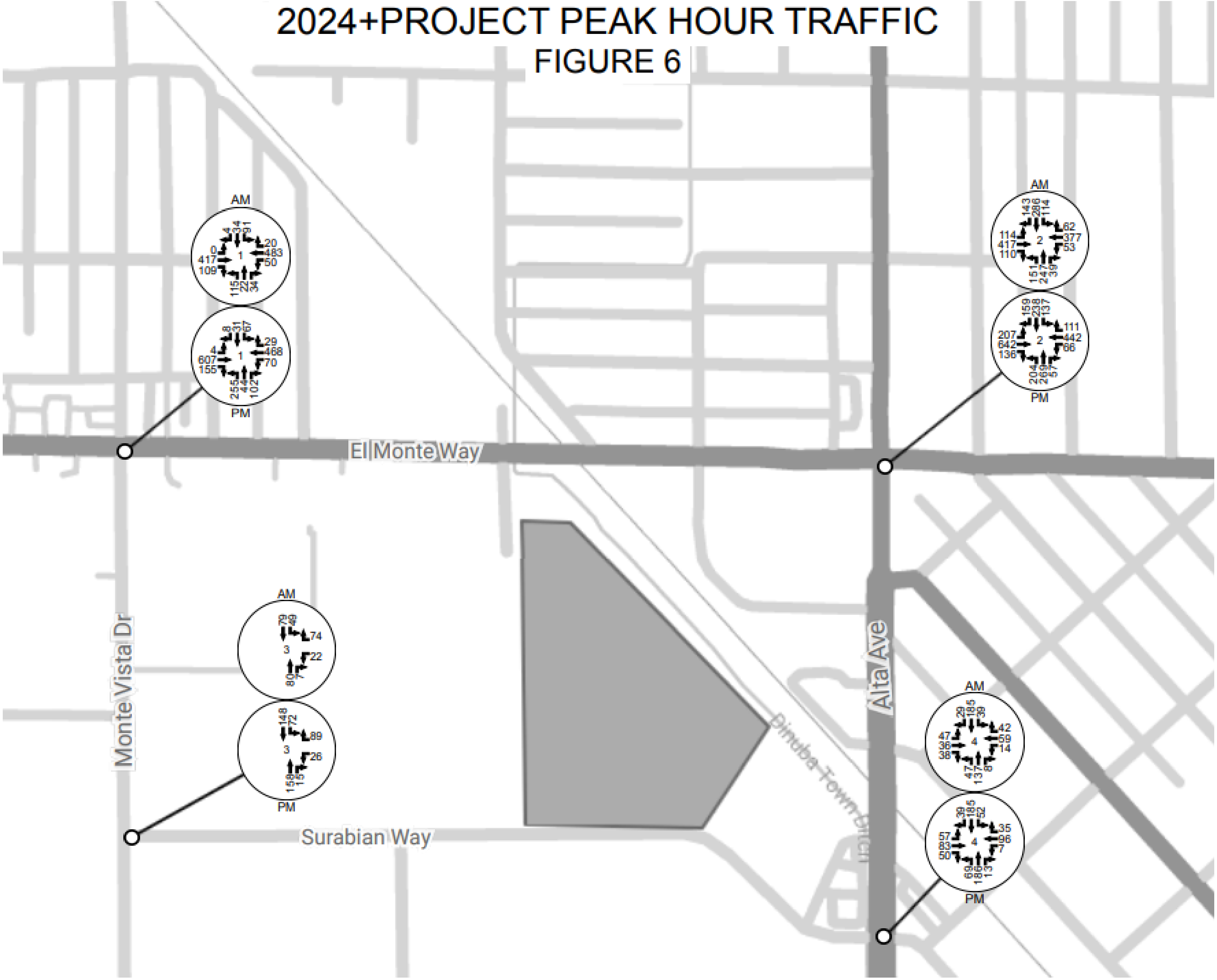
Annual growth rates ranging between 1.77% and 4.79% were applied to existing traffic volumes to estimate future traffic volumes for the year 2044. These growth rates were estimated based on a review of existing and approved future developments in the vicinity of the project and TCAG traffic model data. Future peak hour volumes are shown in Figures 7 and 8.


PROJECT PEAK HOUR TRAFFIC
FIGURE 4
Alta Ave
Dinuba Town Ditch
El Monte Way
Surabian Way
Monte Vista Dr
AM
PM

2024 PEAK HOUR TRAFFIC
FIGURE 5

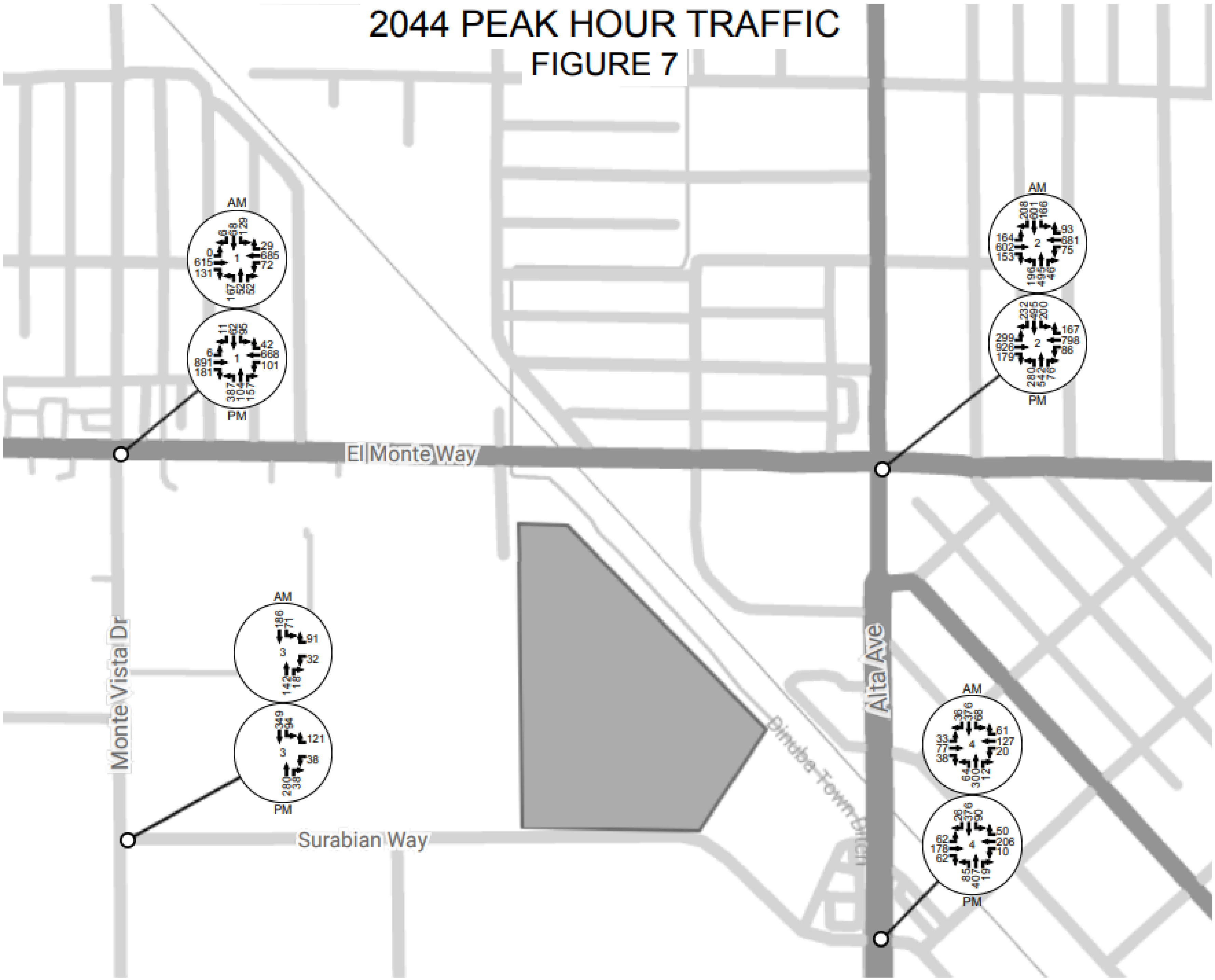


2024+PROJECT PEAK HOUR TRAFFIC
FIGURE 6

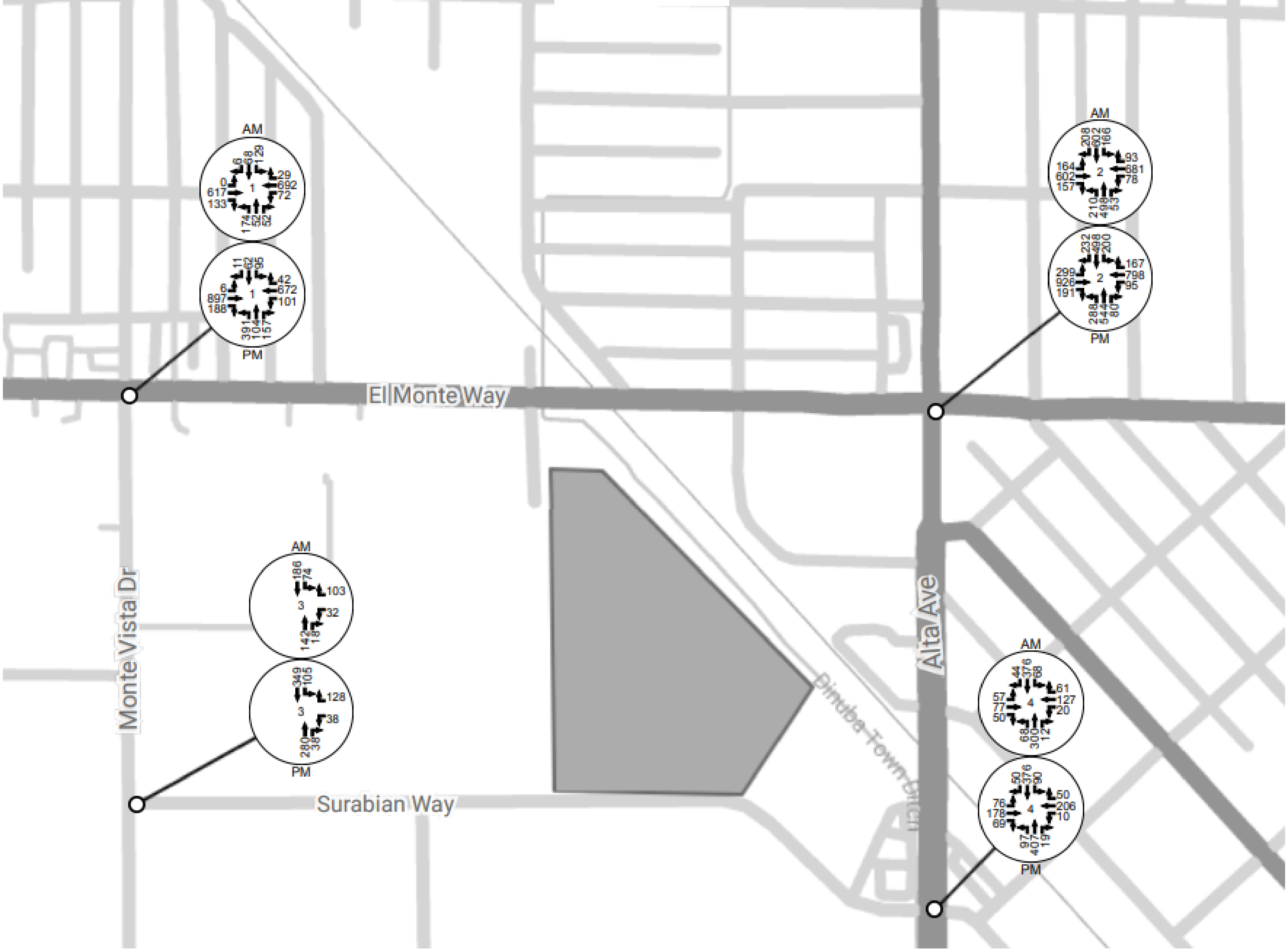


2044 PEAK HOUR TRAFFIC

FIGURE 7



2044+PROJECT PEAK HOUR TRAFFIC
FIGURE 8



INTERSECTION ANALYSIS

A capacity analysis of the study intersections was conducted using Synchro software from Trafficware. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual 2010 (HCM 2010). The analysis was performed for each of the following traffic scenarios.

- Existing (2024)
- Existing (2024) + Project
- Future (2044)
- Future (2044) + Project

Level of service (LOS) criteria for unsignalized and signalized intersections, as defined in HCM 2010, are presented in the tables below.

LEVEL OF SERVICE CRITERIA
UNSIGNALIZED INTERSECTION

Average Control Delay (sec/veh)	Level of Service	Expected Delay to Minor Street Traffic
≤ 10	A	Little or no delay
> 10 and ≤ 15	B	Short traffic delays
> 15 and ≤ 25	C	Average traffic delays
> 25 and ≤ 35	D	Long traffic delays
> 35 and ≤ 50	E	Very long traffic delays
> 50	F	Extreme delays

LEVEL OF SERVICE CRITERIA
SIGNALIZED INTERSECTIONS

Volume/Capacity	Control Delay (sec/veh)	Level of Service
< 0.60	≤ 10	A
0.61 - 0.70	> 10 and ≤ 20	B
0.71 - 0.80	> 20 and ≤ 35	C
0.81 - 0.90	> 35 and ≤ 55	D
0.91 - 1.00	> 55 and ≤ 80	E
> 1.0	> 80	F

Peak hour level of service for the study intersections is presented in Tables 3a and 3b. The City of Dinuba Circulation Element states that the peak hour level of service for intersections shall be LOS C or better for urban areas. It should be noted that LOS D is allowed if the intersection is currently operating at an LOS D prior to the addition of the project traffic in the existing scenario.

Table 3a
PM Intersection Level of Service

#	Intersection	Control Type	2024	2024+ Project	2044	2044+ Project
1	Monte Vista Dr & El Monte Way	Signal	B	B	C	C
2	Alta Ave & El Monte Way	Signal	B	B	C	C
3	Monte Vista Dr & Surabian Dr	WB	A	B	B	B
4	Alta Ave & Surabian Dr/Uruapan Way	Signal	C	C	C	C

Table 3b
AM Intersection Level of Service

#	Intersection	Control Type	2024	2024+ Project	2044	2044+ Project
1	Monte Vista Dr & El Monte Way	Signal	B	B	B	B
2	Alta Ave & El Monte Way	Signal	B	B	C	C
3	Monte Vista Dr & Surabian Dr	WB	A	A	B	B
4	Alta Ave & Surabian Dr/Uruapan Way	Signal	C	C	C	C

TRAFFIC SIGNAL WARRANT ANALYSIS

Peak hour signal warrants were evaluated for the unsignalized intersection within the study based on the 2014 California Manual on Uniform Traffic Control Devices (2014 CA MUTCD). Peak hour signal warrants assess delay to traffic on minor street approaches when entering or crossing a major street. Signal warrant analysis results are shown in Tables 4a and 4b.

Table 4a
Traffic Signal Warrants
Weekday PM Peak Hour

		2024			2024+Project			2044			2044+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
3	Monte Vista Dr at Surabian Dr	382	108	NO	393	115	NO	761	159	NO	772	166	NO

Table 4b
Traffic Signal Warrants
Weekday AM Peak Hour

		2024			2024+Project			2044			2044+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
3	Monte Vista Dr at Surabian Dr	212	84	NO	215	96	NO	417	123	NO	420	135	NO

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are truly justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable level of service or operate below an acceptable level of service and not meet signal warrant criteria.

ROADWAY ANALYSIS

A capacity analysis of the study roadways was conducted using Table 4 in the State of Florida Department of Transportation *Quality/Level of Service Handbook* dated June 2020 (see Appendix). The City of Dinuba Circulation Element states that the peak hour level of service for roadways shall be no lower than LOS C for urban areas. It should be noted that LOS D is allowed if a roadway segment is currently operating at an LOS D prior to the addition of the project traffic in the existing scenario. The analysis was performed for the following AM and PM traffic scenarios:

- Existing (2024)
- Existing (2024) + Project
- Future (2044)
- Future (2044) + Project

Table 5a
PM ROADWAY LEVEL OF SERVICE

Roadway Segment	2024 Two-Way LOS		2024+Project Two-Way LOS		2044 Two-Way LOS		2044+Project Two-Way LOS	
	VOL	LOS	VOL	LOS	VOL	LOS	VOL	LOS
El Monte Way: Monte Vista Dr - Alta Ave	1770	C	1790	C	2714	C	2734	C
Alte Ave: El Monte Way - Surabian Way	932	C	970	C	1658	C	1696	C
Surabian Way: Monte Vista Dr - Alta Ave	337	C	394	C	619	C	676	C
Monte Vista Dr: El Monte Way - Surabian Way	646	C	664	C	1030	C	1048	C

Table 5b
AM ROADWAY LEVEL OF SERVICE

Roadway Segment	2024 Two-Way LOS		2024+Project Two-Way LOS		2044 Two-Way LOS		2044+Project Two-Way LOS	
	VOL	LOS	VOL	LOS	VOL	LOS	VOL	LOS
El Monte Way: Monte Vista Dr - Alta Ave	1294	C	1312	C	2004	C	2022	C
Alta Ave: El Monte Way - Surabian Way	854	C	886	C	1566	C	1598	C
Surabian Way: Monte Vista Dr - Alta Ave	208	C	256	C	375	C	423	C
Monte Vista Dr: El Monte Way - Surabian Way	355	C	370	C	570	C	585	C

VMT ANALYSIS

An evaluation of vehicle miles traveled (VMT) for project traffic was conducted in accordance with California Environmental Quality Act (CEQA) requirements. The City of Dinuba has adopted the "County of Tulare SB 743 Guidelines", dated June 8, 2020, which contains recommendations regarding VMT assessment, significance thresholds and mitigation measures.

Analysis

Baseline VMT was determined utilizing data from the California Statewide Travel Demand Model (CSTDM). The proposed residential project is located in Traffic Analysis Zone (TAZ) 2777, which has an average VMT/capita of 10.70 miles. The proposed residential project is considered a typical project within the TAZ and therefore the project would be expected to have the same VMT per capita. There are no special considerations with the project to assume the project would produce a VMT/capita lower than the average for the TAZ. The threshold of significance for residential project VMT/capita is if the project VMT is below the average in the TAZ where the project is located. Since VMT/capita is assumed to be equal to the average for the aforementioned zone, it is anticipated that the proposed project will have a significant transportation impact prior to mitigation.

Mitigation

The Tulare County guidelines include detailed instructions for mitigation if a project has significant impacts. The guidelines state "The preferred method of VMT mitigation in Tulare County is for project applicants to provide transportation improvements that facilitate travel by walking, bicycling, or transit." In accordance with these guidelines, a survey was conducted within a half mile of the project to determine any pedestrian, bicycle or transit facilities deficiencies exist. After review, sidewalks and ADA compliant wheelchair ramps are proposed to be constructed. The identified improvements include the following and are shown in Figure 9:

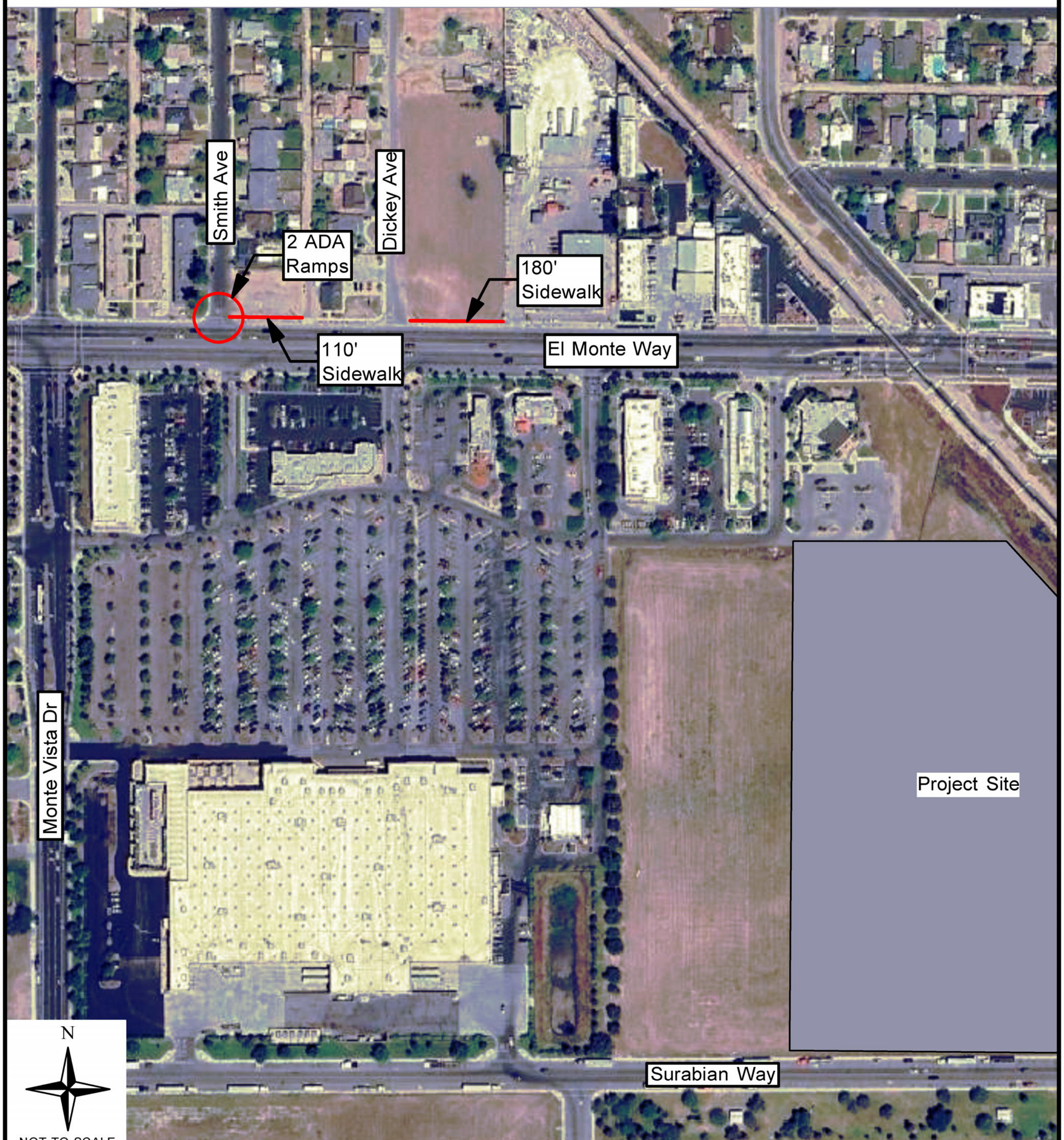
- 110 feet of sidewalk between Dickey Avenue & Smith Avenue on the north side of El Monte Way.
- 180 feet of sidewalk on the east side of Dickey Avenue on the north side of El Monte Way.
- Two (2) ADA compliant curb ramps at Smith Avenue and El Monte Way.

The guidelines include a minimum cost for mitigation of $20 per daily trip generated by the project or 0.5% of the total construction cost of the project (not including land acquisition). As shown in Table 1, the project is anticipated to generate 883 daily trips, which equates to a target value of improvements of

$17,660. The total mitigation cost, for the identified improvements, is estimated at approximately $18,162 with a 20% contingency.

Pursuant to the guidelines, if a project provides mitigation which meets the minimum target listed above, the project can presume a 1% reduction in VMT. The assumed VMT/capita reduction is 1% of 10.70 or 0.107. The resulting VMT/capita after mitigation is 10.59 which is below the average VMT/capita in the TAZ which the project is located. After mitigation, the project will have a less than significant transportation impact.

VMT MITIGATION
FIGURE 9



SUMMARY AND CONCLUSIONS

The purpose of this study is to evaluate the potential traffic impacts of a proposed residential development located south of El Monte Way, north of Surabian Way, on the west side of Alta Avenue in Dinuba, CA. The study included both level of service (LOS) and vehicle miles traveled (VMT) analyses.

All four study intersections currently operate above LOS D during peak hours with and without project traffic in 2024. All intersections are anticipated to continue to operate above LOS D in 2044 prior to, and with the addition of project traffic. Therefore, no improvements are recommended.

All roadway segments within the scope of the study currently operate above LOS C during peak hours prior to, and with the addition of project traffic in 2024. All roadway segments are anticipated to continue to operate at LOS C in 2044 prior to, and with the addition of project traffic. Therefore, no improvements are recommended.

Project VMT analysis showed a VMT which was equal to the existing local VMT in the area, which indicates a transportation impact under CEQA. With implementation of the mitigation measures identified above for reduction of VMT, the project will have a less than significant transportation impact.

REFERENCES

1. Highway Capacity Manual, Special Report 209, Transportation Research Board
2. California Manual on Uniform Traffic Control Devices for Streets and Highways, 2012 Edition, Federal Highway Administration (FHA)
3. Caltrans Guide for the Preparation of Traffic Impact Studies, June 2001
4. City of Dinuba General Plan Policies Statement, September 23, 2008
5. County of Tulare SB 743 Guidelines, June 8, 2020
6. Technical Advisory on Evaluating Impacts in CEQA, Governor's Office of Planning and Research, December 2018
7. Trip Generation, 11th Edition, Institute of Transportation Engineers (ITE)

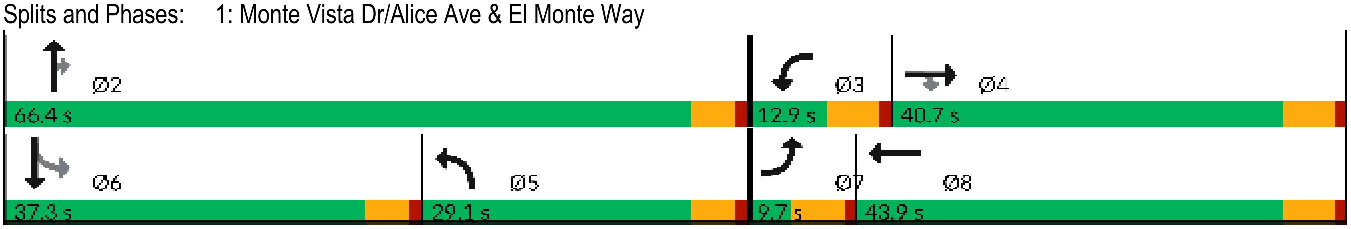
APPENDIX

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	601	148	70	464	29	251	44	102	67	31	8
Future Volume (vph)	4	601	148	70	464	29	251	44	102	67	31	8
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.991				0.850		0.990	
Flt Protected	0.950			0.950			0.950				0.969	
Satd. Flow (prot)	1630	3539	1458	1630	3499	0	1630	1863	1458	0	1784	0
Flt Permitted	0.950			0.950			0.950				0.783	
Satd. Flow (perm)	1630	3539	1413	1630	3499	0	1630	1863	1431	0	1442	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			161		6				111		3	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	653	161	76	504	32	273	48	111	73	34	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	653	161	76	536	0	273	48	111	0	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	9.7	40.7	40.7	12.9	43.9		29.1	66.4	66.4	37.3	37.3	
Total Split (%)	8.1%	33.9%	33.9%	10.8%	36.6%		24.3%	55.3%	55.3%	31.1%	31.1%	
Maximum Green (s)	4.0	35.0	35.0	7.2	38.2		24.2	61.5	61.5	32.4	32.4	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag			Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)	6.3	24.2	24.2	9.5	32.4		20.7	40.4	40.4		15.3	
Actuated g/C Ratio	0.08	0.29	0.29	0.11	0.39		0.25	0.49	0.49		0.18	
v/c Ratio	0.03	0.63	0.31	0.41	0.39		0.67	0.05	0.15		0.43	
Control Delay (s/veh)	48.5	30.8	6.6	50.2	20.8		41.8	13.3	3.4		38.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)	48.5	30.8	6.6	50.2	20.8		41.8	13.3	3.4		38.2	
LOS	D	C	A	D	C		D	B	A		D	
Approach Delay (s/veh)		26.1			24.4			28.8			38.2	
Approach LOS		C			C			C			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 83	
Natural Cycle: 110	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay (s/veh): 26.9	Intersection LOS: C
Intersection Capacity Utilization 54.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	601	148	70	464	29	251	44	102	67	31	8
Future Volume (veh/h)	4	601	148	70	464	29	251	44	102	67	31	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	4	653	161	76	504	32	273	48	111	73	34	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	51	1055	420	136	1182	75	349	808	620	212	87	17
Arrive On Green	0.03	0.30	0.30	0.08	0.35	0.32	0.21	0.43	0.43	0.16	0.16	0.14
Sat Flow, veh/h	1641	3554	1415	1641	3386	214	1641	1870	1436	768	556	111
Grp Volume(v), veh/h	4	653	161	76	264	272	273	48	111	116	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1415	1641	1777	1824	1641	1870	1436	1436	0	0
Q Serve(g_s), s	0.2	10.1	2.6	2.8	7.2	7.3	10.0	1.0	3.0	3.3	0.0	0.0
Cycle Q Clear(g_c), s	0.2	10.1	2.6	2.8	7.2	7.3	10.0	1.0	3.0	4.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	0.63		0.08
Lane Grp Cap(c), veh/h	51	1055	420	136	620	637	349	808	620	317	0	0
V/C Ratio(X)	0.08	0.62	0.38	0.56	0.43	0.43	0.78	0.06	0.18	0.37	0.00	0.00
Avail Cap(c_a), veh/h	147	2044	814	229	1111	1141	645	1829	1404	822	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	30.0	19.3	3.5	28.1	15.9	16.0	23.7	10.6	11.2	24.5	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.6	0.6	3.5	0.5	0.5	3.9	0.0	0.1	0.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.5	1.5	1.1	2.4	2.5	3.6	0.3	0.8	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	30.7	19.9	4.1	31.6	16.3	16.4	27.6	10.6	11.3	25.2	0.0	0.0
LnGrp LOS	C	B	A	C	B	B	C	B	B	C		
Approach Vol, veh/h		818			612			432			116	
Approach Delay, s/veh		16.9			18.3			21.5			25.2	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.6	9.3	22.9	17.6	14.0	6.0	26.3
Change Period (Y+Rc), s	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	61.5	7.2	35.0	24.2	32.4	4.0	38.2
Max Q Clear Time (g_c+I1), s	5.0	4.8	12.1	12.0	6.5	2.2	9.3
Green Ext Time (p_c), s	0.6	0.0	3.5	0.7	0.4	0.0	1.9

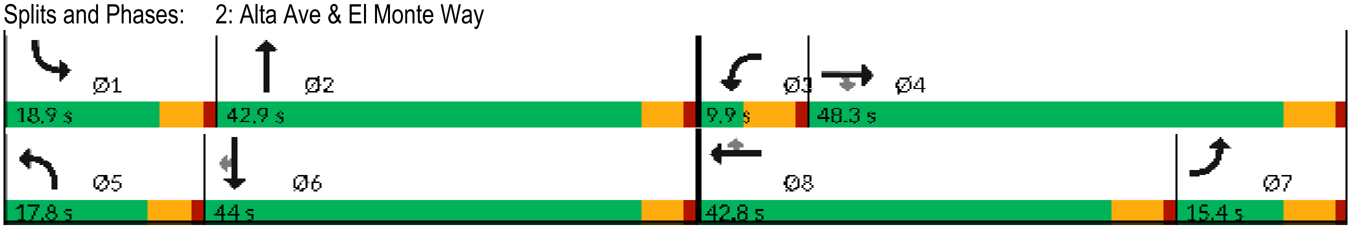
Intersection Summary	
HCM 7th Control Delay, s/veh	18.8
HCM 7th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	642	124	57	442	111	196	267	53	137	235	159
Future Volume (vph)	207	642	124	57	442	111	196	267	53	137	235	159
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.975				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3440	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1431	3162	3539	1432	3162	3440	0	1630	3539	1432
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			135			119		21				173
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	225	698	135	62	480	121	213	290	58	149	255	173
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	698	135	62	480	121	213	348	0	149	255	173
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	15.4	48.3	48.3	9.9	42.8	42.8	17.8	42.9		18.9	44.0	44.0
Total Split (%)	12.8%	40.3%	40.3%	8.3%	35.7%	35.7%	14.8%	35.8%		15.8%	36.7%	36.7%
Maximum Green (s)	9.7	42.6	42.6	4.2	37.1	37.1	12.9	38.0		14.0	39.1	39.1
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	11.7	28.1	28.1	6.3	20.0	20.0	11.6	16.7		13.4	18.4	18.4
Actuated g/C Ratio	0.15	0.36	0.36	0.08	0.25	0.25	0.15	0.21		0.17	0.23	0.23
v/c Ratio	0.48	0.55	0.23	0.25	0.54	0.27	0.46	0.47		0.54	0.31	0.37
Control Delay (s/veh)	39.2	24.1	5.4	43.7	28.3	7.2	38.0	27.8		42.7	26.4	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	39.2	24.1	5.4	43.7	28.3	7.2	38.0	27.8		42.7	26.4	6.9
LOS	D	C	A	D	C	A	D	C		D	C	A
Approach Delay (s/veh)		24.9			25.9			31.7			24.7	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 78.7	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.55	
Intersection Signal Delay (s/veh): 26.4	Intersection LOS: C
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	642	124	57	442	111	196	267	53	137	235	159
Future Volume (veh/h)	207	642	124	57	442	111	196	267	53	137	235	159
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	225	698	135	62	480	121	213	290	58	149	255	173
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	425	1134	457	233	919	370	375	591	116	213	755	304
Arrive On Green	0.13	0.32	0.32	0.07	0.26	0.26	0.12	0.20	0.18	0.13	0.21	0.21
Sat Flow, veh/h	3183	3554	1434	3183	3554	1432	3183	2947	580	1641	3554	1429
Grp Volume(v), veh/h	225	698	135	62	480	121	213	173	175	149	255	173
Grp Sat Flow(s),veh/h/ln	1591	1777	1434	1591	1777	1432	1591	1777	1750	1641	1777	1429
Q Serve(g_s), s	3.8	9.6	4.1	1.1	6.7	2.2	3.6	5.0	5.1	5.0	3.5	3.8
Cycle Q Clear(g_c), s	3.8	9.6	4.1	1.1	6.7	2.2	3.6	5.0	5.1	5.0	3.5	3.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	425	1134	457	233	919	370	375	356	351	213	755	304
V/C Ratio(X)	0.53	0.62	0.30	0.27	0.52	0.33	0.57	0.49	0.50	0.70	0.34	0.57
Avail Cap(c_a), veh/h	629	2731	1102	326	2392	964	762	1199	1181	424	2466	992
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	16.6	14.8	25.3	18.3	5.4	24.0	20.4	20.6	24.0	19.3	7.7
Incr Delay (d2), s/veh	1.0	0.5	0.4	0.6	0.5	0.5	1.4	1.0	1.1	4.1	0.3	1.7
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	1.3	3.1	1.1	0.4	2.2	1.0	1.2	1.8	1.8	1.9	1.2	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.3	17.2	15.1	25.9	18.8	5.9	25.4	21.4	21.7	28.2	19.5	9.4
LnGrp LOS	C	B	B	C	B	A	C	C	C	C	B	A
Approach Vol, veh/h		1058			663			561			577	
Approach Delay, s/veh		18.4			17.1			23.0			18.7	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	15.6	8.2	22.4	10.8	16.2	11.7	18.9
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	14.0	38.0	4.2	42.6	12.9	39.1	9.7	37.1
Max Q Clear Time (g_c+I1), s	7.0	7.1	3.1	11.6	5.6	5.8	5.8	8.7
Green Ext Time (p_c), s	0.2	1.2	0.0	3.7	0.4	1.7	0.3	2.5

Intersection Summary	
HCM 7th Control Delay, s/veh	19.1
HCM 7th LOS	B

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	82	158	15	61	148
Future Volume (vph)	26	82	158	15	61	148
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.987			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3493	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3493	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	89	172	16	66	161
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	89	188	0	66	161
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 21.8%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	3.2					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	82	158	15	61	148
Future Vol, veh/h	26	82	158	15	61	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	89	172	16	66	161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	473	94	0	0	188	0
Stage 1	180	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	534	945	-	-	1385	-
Stage 1	834	-	-	-	-	-
Stage 2	756	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	509	945	-	-	1385	-
Mov Cap-2 Maneuver	509	-	-	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	720	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10	0	2.26
HCM LOS	A		

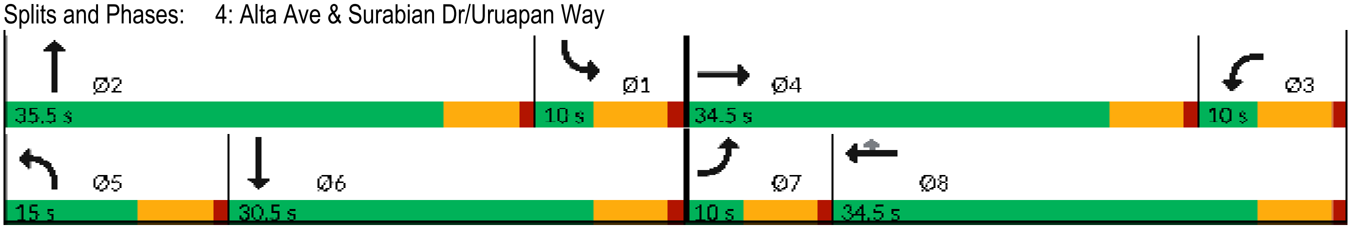
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	509	945	1385	-
HCM Lane V/C Ratio	-	-	0.056	0.094	0.048	-
HCM Control Delay (s/veh)	-	-	12.5	9.2	7.7	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.3	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	83	43	7	96	35	57	186	13	52	185	15
Future Volume (vph)	43	83	43	7	96	35	57	186	13	52	185	15
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.949				0.850		0.990			0.989	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1768	0	1630	1863	1458	1630	3504	0	1630	3500	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1768	0	1630	1863	1458	1630	3504	0	1630	3500	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31				255		8			9	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	90	47	8	104	38	62	202	14	57	201	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	47	137	0	8	104	38	62	216	0	57	217	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	10.0	34.5		10.0	34.5	34.5	15.0	35.5		10.0	30.5	
Total Split (%)	11.1%	38.3%		11.1%	38.3%	38.3%	16.7%	39.4%		11.1%	33.9%	
Maximum Green (s)	4.0	28.5		4.0	28.5	28.5	9.0	29.5		4.0	24.5	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	4.2	15.3		4.2	11.6	11.6	7.7	36.3		4.2	36.1	
Actuated g/C Ratio	0.06	0.22		0.06	0.17	0.17	0.11	0.53		0.06	0.53	
v/c Ratio	0.48	0.33		0.08	0.33	0.08	0.34	0.12		0.58	0.12	
Control Delay (s/veh)	54.7	19.5		38.9	28.6	0.3	37.7	14.4		61.9	16.2	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	54.7	19.5		38.9	28.6	0.3	37.7	14.4		61.9	16.2	
LOS	D	B		D	C	A	D	B		E	B	
Approach Delay (s/veh)		28.4			22.0			19.6			25.7	
Approach LOS		C			C			B			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 68.5	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay (s/veh): 23.7	Intersection LOS: C
Intersection Capacity Utilization 33.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	83	43	7	96	35	57	186	13	52	185	15
Future Volume (veh/h)	43	83	43	7	96	35	57	186	13	52	185	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	47	90	47	8	104	38	62	202	14	57	201	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	58	132	69	21	172	134	76	1545	106	69	1514	120
Arrive On Green	0.04	0.11	0.11	0.01	0.09	0.09	0.05	0.46	0.46	0.04	0.45	0.45
Sat Flow, veh/h	1641	1157	604	1641	1870	1460	1641	3373	232	1641	3336	263
Grp Volume(v), veh/h	47	0	137	8	104	38	62	106	110	57	106	111
Grp Sat Flow(s),veh/h/ln	1641	0	1762	1641	1870	1460	1641	1777	1829	1641	1777	1823
Q Serve(g_s), s	1.8	0.0	4.8	0.3	3.4	1.2	2.4	2.2	2.2	2.2	2.2	2.3
Cycle Q Clear(g_c), s	1.8	0.0	4.8	0.3	3.4	1.2	2.4	2.2	2.2	2.2	2.2	2.3
Prop In Lane	1.00		0.34	1.00		1.00	1.00		0.13	1.00		0.14
Lane Grp Cap(c), veh/h	58	0	201	21	172	134	76	814	838	69	806	827
V/C Ratio(X)	0.81	0.00	0.68	0.37	0.60	0.28	0.82	0.13	0.13	0.83	0.13	0.13
Avail Cap(c_a), veh/h	102	0	780	102	828	646	229	814	838	102	806	827
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	0.0	27.4	31.5	28.1	15.3	30.4	10.1	10.1	30.6	10.2	10.2
Incr Delay (d2), s/veh	22.7	0.0	4.0	10.4	3.4	1.1	18.6	0.3	0.3	28.6	0.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	2.0	0.2	1.5	0.5	1.2	0.7	0.7	1.3	0.7	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.6	0.0	31.4	41.9	31.5	16.4	49.1	10.4	10.4	59.2	10.6	10.6
LnGrp LOS	D		C	D	C	B	D	B	B	E	B	B
Approach Vol, veh/h		184			150			278			274	
Approach Delay, s/veh		37.1			28.2			19.0			20.7	
Approach LOS		D			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	35.5	6.8	13.4	9.0	35.2	8.3	11.9
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	4.0	29.5	4.0	28.5	9.0	24.5	4.0	28.5
Max Q Clear Time (g_c+I1), s	4.2	4.2	2.3	6.8	4.4	4.3	3.8	5.4
Green Ext Time (p_c), s	0.0	1.0	0.0	0.6	0.0	0.9	0.0	0.5

Intersection Summary	
HCM 7th Control Delay, s/veh	24.8
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	607	155	70	468	29	255	44	102	67	31	8
Future Volume (vph)	4	607	155	70	468	29	255	44	102	67	31	8
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.991				0.850		0.990	
Flt Protected	0.950			0.950			0.950				0.969	
Satd. Flow (prot)	1630	3539	1458	1630	3499	0	1630	1863	1458	0	1784	0
Flt Permitted	0.950			0.950			0.950				0.783	
Satd. Flow (perm)	1630	3539	1414	1630	3499	0	1630	1863	1431	0	1442	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			168		6				111		3	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	660	168	76	509	32	277	48	111	73	34	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	4	660	168	76	541	0	277	48	111	0	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	9.7	41.7	41.7	12.0	44.0		29.0	66.3	66.3	37.3	37.3	
Total Split (%)	8.1%	34.8%	34.8%	10.0%	36.7%		24.2%	55.3%	55.3%	31.1%	31.1%	
Maximum Green (s)	4.0	36.0	36.0	6.3	38.3		24.1	61.4	61.4	32.4	32.4	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag			Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)	6.2	24.7	24.7	8.7	32.3		21.1	40.7	40.7		15.3	
Actuated g/C Ratio	0.07	0.30	0.30	0.10	0.39		0.25	0.49	0.49		0.18	
v/c Ratio	0.03	0.63	0.31	0.45	0.40		0.67	0.05	0.15		0.43	
Control Delay (s/veh)	48.0	30.3	6.4	52.4	21.0		41.1	13.0	3.3		37.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)	48.0	30.3	6.4	52.4	21.0		41.1	13.0	3.3		37.8	
LOS	D	C	A	D	C		D	B	A		D	
Approach Delay (s/veh)		25.6			24.9			28.4			37.8	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 83.1

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

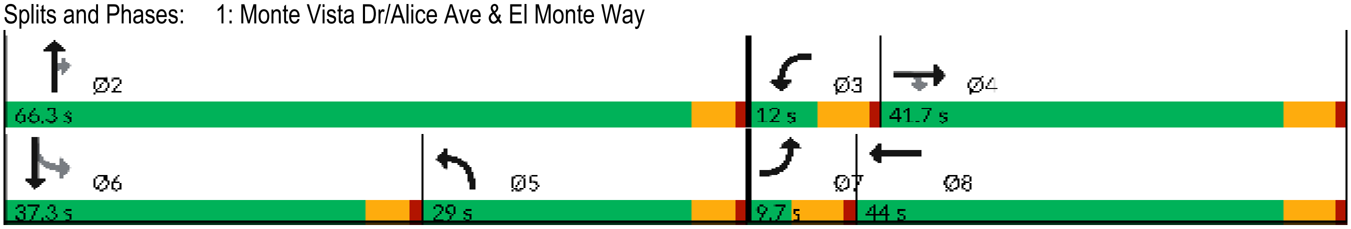
Maximum v/c Ratio: 0.67

Intersection Signal Delay (s/veh): 26.7 Intersection LOS: C

Intersection Capacity Utilization 55.2% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	607	155	70	468	29	255	44	102	67	31	8
Future Volume (veh/h)	4	607	155	70	468	29	255	44	102	67	31	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	4	660	168	76	509	32	277	48	111	73	34	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	1060	422	136	1188	74	352	809	621	211	87	17
Arrive On Green	0.03	0.30	0.30	0.08	0.35	0.32	0.21	0.43	0.43	0.16	0.16	0.14
Sat Flow, veh/h	1641	3554	1415	1641	3389	213	1641	1870	1436	769	555	111
Grp Volume(v), veh/h	4	660	168	76	266	275	277	48	111	116	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1415	1641	1777	1824	1641	1870	1436	1436	0	0
Q Serve(g_s), s	0.2	10.3	2.7	2.9	7.4	7.4	10.3	1.0	3.1	3.4	0.0	0.0
Cycle Q Clear(g_c), s	0.2	10.3	2.7	2.9	7.4	7.4	10.3	1.0	3.1	4.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	0.63		0.08
Lane Grp Cap(c), veh/h	50	1060	422	136	623	640	352	809	621	315	0	0
V/C Ratio(X)	0.08	0.62	0.40	0.56	0.43	0.43	0.79	0.06	0.18	0.37	0.00	0.00
Avail Cap(c_a), veh/h	145	2078	827	204	1102	1132	636	1807	1387	813	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	30.4	19.5	3.5	28.4	16.0	16.1	23.9	10.6	11.2	24.8	0.0	0.0
Incr Delay (d2), s/veh	0.7	0.6	0.6	3.6	0.5	0.5	3.9	0.0	0.1	0.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.6	1.5	1.1	2.5	2.6	3.7	0.3	0.8	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	31.0	20.1	4.1	32.0	16.5	16.5	27.8	10.7	11.4	25.5	0.0	0.0
LnGrp LOS	C	C	A	C	B	B	C	B	B	C		
Approach Vol, veh/h		832			617			436			116	
Approach Delay, s/veh		16.9			18.4			21.8			25.5	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.9	9.3	23.2	17.8	14.1	6.0	26.6
Change Period (Y+Rc), s	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	61.4	6.3	36.0	24.1	32.4	4.0	38.3
Max Q Clear Time (g_c+I1), s	5.1	4.9	12.3	12.3	6.6	2.2	9.4
Green Ext Time (p_c), s	0.6	0.0	3.6	0.7	0.4	0.0	1.9

Intersection Summary	
HCM 7th Control Delay, s/veh	18.9
HCM 7th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	642	136	66	442	111	204	269	57	137	238	159
Future Volume (vph)	207	642	136	66	442	111	204	269	57	137	238	159
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.974				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3436	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1431	3162	3539	1432	3162	3436	0	1630	3539	1432
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			158			158		22				173
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	225	698	148	72	480	121	222	292	62	149	259	173
Shared Lane Traffic (%)												
Lane Group Flow (vph)	225	698	148	72	480	121	222	354	0	149	259	173
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	15.4	47.9	47.9	10.3	42.8	42.8	18.2	42.9		18.9	43.6	43.6
Total Split (%)	12.8%	39.9%	39.9%	8.6%	35.7%	35.7%	15.2%	35.8%		15.8%	36.3%	36.3%
Maximum Green (s)	9.7	42.2	42.2	4.6	37.1	37.1	13.3	38.0		14.0	38.7	38.7
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	11.7	27.0	27.0	7.5	20.0	20.0	11.9	16.9		13.4	18.4	18.4
Actuated g/C Ratio	0.15	0.34	0.34	0.09	0.25	0.25	0.15	0.21		0.17	0.23	0.23
v/c Ratio	0.48	0.58	0.25	0.24	0.54	0.25	0.47	0.47		0.54	0.31	0.37
Control Delay (s/veh)	39.4	26.0	5.0	41.0	28.4	3.3	38.0	27.8		42.9	26.6	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	39.4	26.0	5.0	41.0	28.4	3.3	38.0	27.8		42.9	26.6	6.9
LOS	D	C	A	D	C	A	D	C		D	C	A
Approach Delay (s/veh)		25.9			25.3			31.8			24.9	
Approach LOS		C			C			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 79

Natural Cycle: 105

Control Type: Actuated-Uncoordinated

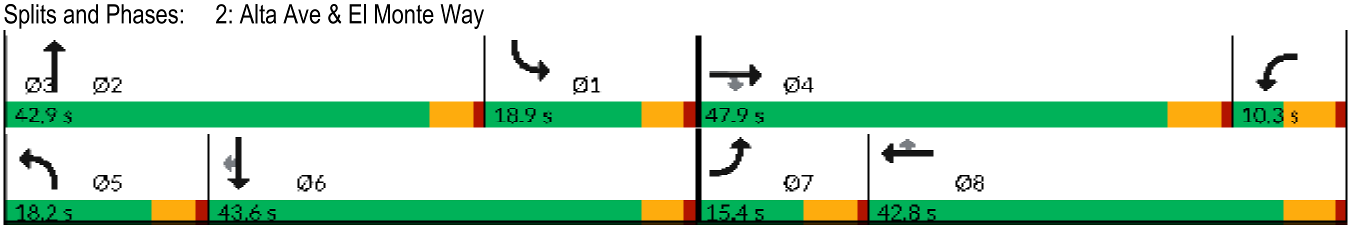
Maximum v/c Ratio: 0.58

Intersection Signal Delay (s/veh): 26.7 Intersection LOS: C

Intersection Capacity Utilization 56.9% ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	642	136	66	442	111	204	269	57	137	238	159
Future Volume (veh/h)	207	642	136	66	442	111	204	269	57	137	238	159
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	225	698	148	72	480	121	222	292	62	149	259	173
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	415	1122	453	239	926	373	381	582	122	232	787	317
Arrive On Green	0.13	0.32	0.32	0.08	0.26	0.26	0.12	0.20	0.18	0.14	0.22	0.22
Sat Flow, veh/h	3183	3554	1434	3183	3554	1432	3183	2913	608	1641	3554	1430
Grp Volume(v), veh/h	225	698	148	72	480	121	222	176	178	149	259	173
Grp Sat Flow(s),veh/h/ln	1591	1777	1434	1591	1777	1432	1591	1777	1744	1641	1777	1430
Q Serve(g_s), s	4.0	10.0	2.6	1.3	6.9	2.2	3.9	5.3	5.4	5.1	3.7	6.4
Cycle Q Clear(g_c), s	4.0	10.0	2.6	1.3	6.9	2.2	3.9	5.3	5.4	5.1	3.7	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	415	1122	453	239	926	373	381	355	349	232	787	317
V/C Ratio(X)	0.54	0.62	0.33	0.30	0.52	0.32	0.58	0.50	0.51	0.64	0.33	0.55
Avail Cap(c_a), veh/h	607	2611	1053	336	2308	930	757	1157	1136	409	2356	948
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	17.4	4.7	26.1	18.9	5.4	24.9	21.2	21.4	24.2	19.5	20.6
Incr Delay (d2), s/veh	1.1	0.6	0.4	0.7	0.5	0.5	1.4	1.1	1.2	3.0	0.2	1.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	3.3	1.2	0.4	2.3	1.1	1.3	1.9	2.0	1.9	1.3	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.4	18.0	5.1	26.8	19.3	5.9	26.3	22.3	22.6	27.2	19.8	22.1
LnGrp LOS	C	B	A	C	B	A	C	C	C	C	B	C
Approach Vol, veh/h		1071			673			576			581	
Approach Delay, s/veh		17.8			17.7			23.9			22.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	15.9	8.5	22.9	11.2	17.2	11.8	19.6
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	14.0	38.0	4.6	42.2	13.3	38.7	9.7	37.1
Max Q Clear Time (g_c+I1), s	7.1	7.4	3.3	12.0	5.9	8.4	6.0	8.9
Green Ext Time (p_c), s	0.2	1.2	0.0	3.8	0.5	1.7	0.3	2.5

Intersection Summary	
HCM 7th Control Delay, s/veh	19.9
HCM 7th LOS	B

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	26	89	158	15	72	148
Future Volume (vph)	26	89	158	15	72	148
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.987			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3493	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3493	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	97	172	16	78	161
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	97	188	0	78	161
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 22.5%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	89	158	15	72	148
Future Vol, veh/h	26	89	158	15	72	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	97	172	16	78	161

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	497	94	0	0	188	0
Stage 1	180	-	-	-	-	-
Stage 2	317	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	517	945	-	-	1385	-
Stage 1	834	-	-	-	-	-
Stage 2	737	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	488	945	-	-	1385	-
Mov Cap-2 Maneuver	488	-	-	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10.06	0	2.54
HCM LOS	B		

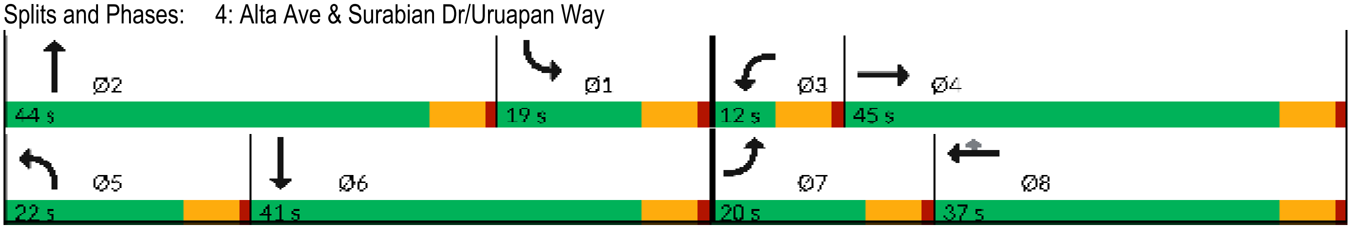
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	488	945	1385	-
HCM Lane V/C Ratio	-	-	0.058	0.102	0.057	-
HCM Control Delay (s/veh)	-	-	12.8	9.2	7.8	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.3	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	83	50	7	96	35	69	186	13	52	185	39
Future Volume (vph)	57	83	50	7	96	35	69	186	13	52	185	39
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.944				0.850		0.990			0.974	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1758	0	1630	1863	1458	1630	3504	0	1630	3447	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1758	0	1630	1863	1458	1630	3504	0	1630	3447	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27				245		6			21	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	90	54	8	104	38	75	202	14	57	201	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	144	0	8	104	38	75	216	0	57	243	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	20.0	45.0		12.0	37.0	37.0	22.0	44.0		19.0	41.0	
Total Split (%)	16.7%	37.5%		10.0%	30.8%	30.8%	18.3%	36.7%		15.8%	34.2%	
Maximum Green (s)	14.0	39.0		6.0	31.0	31.0	16.0	38.0		13.0	35.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	9.0	22.6		6.0	12.5	12.5	9.7	41.5		8.7	40.6	
Actuated g/C Ratio	0.10	0.25		0.07	0.14	0.14	0.11	0.46		0.10	0.45	
v/c Ratio	0.38	0.31		0.07	0.40	0.09	0.43	0.13		0.36	0.16	
Control Delay (s/veh)	49.3	23.8		49.0	41.8	0.4	49.5	19.0		49.3	18.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	49.3	23.8		49.0	41.8	0.4	49.5	19.0		49.3	18.8	
LOS	D	C		D	D	A	D	B		D	B	
Approach Delay (s/veh)		31.5			31.7			26.9			24.6	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 90.1	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay (s/veh): 27.9	Intersection LOS: C
Intersection Capacity Utilization 35.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	83	50	7	96	35	69	186	13	52	185	39
Future Volume (veh/h)	57	83	50	7	96	35	69	186	13	52	185	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	62	90	54	8	104	38	75	202	14	57	201	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	77	138	83	13	163	127	95	1701	117	70	1438	295
Arrive On Green	0.05	0.13	0.13	0.01	0.09	0.09	0.06	0.50	0.50	0.04	0.49	0.49
Sat Flow, veh/h	1641	1095	657	1641	1870	1460	1641	3373	232	1641	2937	602
Grp Volume(v), veh/h	62	0	144	8	104	38	75	106	110	57	120	123
Grp Sat Flow(s),veh/h/ln	1641	0	1752	1641	1870	1460	1641	1777	1829	1641	1777	1762
Q Serve(g_s), s	2.8	0.0	5.9	0.4	4.0	1.4	3.4	2.4	2.4	2.6	2.8	2.9
Cycle Q Clear(g_c), s	2.8	0.0	5.9	0.4	4.0	1.4	3.4	2.4	2.4	2.6	2.8	2.9
Prop In Lane	1.00		0.38	1.00		1.00	1.00		0.13	1.00		0.34
Lane Grp Cap(c), veh/h	77	0	221	13	163	127	95	896	922	70	870	863
V/C Ratio(X)	0.80	0.00	0.65	0.60	0.64	0.30	0.79	0.12	0.12	0.81	0.14	0.14
Avail Cap(c_a), veh/h	305	0	907	131	770	601	348	896	922	283	870	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	31.4	37.2	33.2	19.5	35.1	9.8	9.8	35.7	10.5	10.6
Incr Delay (d2), s/veh	17.2	0.0	3.2	35.7	4.1	1.3	13.7	0.3	0.3	19.1	0.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	2.4	0.3	1.8	0.6	1.6	0.8	0.8	1.3	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.7	0.0	34.6	72.9	37.4	20.8	48.7	10.1	10.1	54.9	10.9	10.9
LnGrp LOS	D		C	E	D	C	D	B	B	D	B	B
Approach Vol, veh/h		206			150			291			300	
Approach Delay, s/veh		40.0			35.1			20.1			19.2	
Approach LOS		D			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	44.0	6.6	15.5	10.3	42.9	9.5	12.6
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	13.0	38.0	6.0	39.0	16.0	35.0	14.0	31.0
Max Q Clear Time (g_c+I1), s	4.6	4.4	2.4	7.9	5.4	4.9	4.8	6.0
Green Ext Time (p_c), s	0.0	1.0	0.0	0.7	0.1	1.2	0.1	0.5

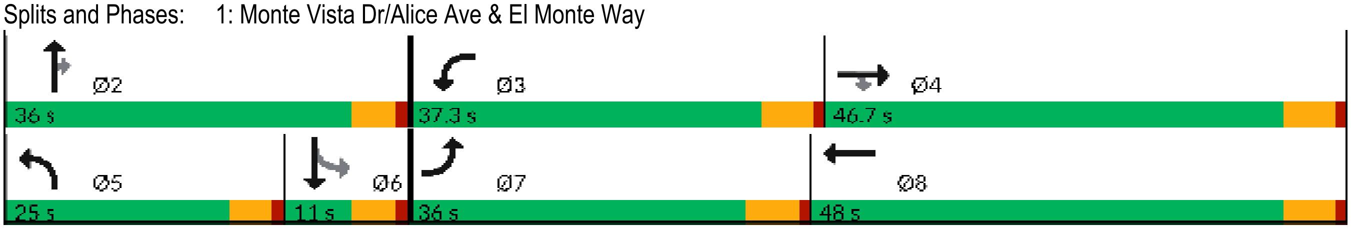
Intersection Summary	
HCM 7th Control Delay, s/veh	26.5
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	891	181	101	668	42	387	104	157	95	62	11
Future Volume (vph)	6	891	181	101	668	42	387	104	157	95	62	11
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.991				0.850		0.991	
Flt Protected	0.950			0.950			0.950				0.972	
Satd. Flow (prot)	1630	3539	1458	1630	3499	0	1630	1863	1458	0	1791	0
Flt Permitted	0.950			0.950			0.950				0.762	
Satd. Flow (perm)	1630	3539	1414	1630	3499	0	1630	1863	1430	0	1404	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			148		6				171		2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	968	197	110	726	46	421	113	171	103	67	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	968	197	110	772	0	421	113	171	0	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	36.0	46.7	46.7	37.3	48.0		25.0	36.0	36.0	11.0	11.0	
Total Split (%)	30.0%	38.9%	38.9%	31.1%	40.0%		20.8%	30.0%	30.0%	9.2%	9.2%	
Maximum Green (s)	30.3	41.0	41.0	31.6	42.3		20.1	31.1	31.1	6.1	6.1	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)	8.0	33.1	33.1	14.1	49.4		21.8	37.0	37.0		11.0	
Actuated g/C Ratio	0.08	0.34	0.34	0.15	0.51		0.23	0.38	0.38		0.11	
v/c Ratio	0.05	0.80	0.34	0.46	0.43		1.15	0.16	0.26		1.12	
Control Delay (s/veh)	51.2	35.8	9.8	47.8	17.3		129.4	22.2	4.6		149.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)	51.2	35.8	9.8	47.8	17.3		129.4	22.2	4.6		149.8	
LOS	D	D	A	D	B		F	C	A		F	
Approach Delay (s/veh)		31.5			21.1			81.9			149.8	
Approach LOS		C			C			F			F	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 96.6	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay (s/veh): 47.8	Intersection LOS: D
Intersection Capacity Utilization 71.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	891	181	101	668	42	387	104	157	95	62	11
Future Volume (veh/h)	6	891	181	101	668	42	387	104	157	95	62	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	7	968	197	110	726	46	421	113	171	103	67	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	1275	508	173	1478	94	419	729	559	132	41	7
Arrive On Green	0.03	0.36	0.36	0.11	0.44	0.42	0.26	0.39	0.39	0.09	0.09	0.07
Sat Flow, veh/h	1641	3554	1418	1641	3387	214	1641	1870	1435	742	482	86
Grp Volume(v), veh/h	7	968	197	110	381	391	421	113	171	182	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1418	1641	1777	1825	1641	1870	1435	1311	0	0
Q Serve(g_s), s	0.3	19.7	8.5	5.3	12.6	12.7	21.0	3.2	6.8	7.0	0.0	0.0
Cycle Q Clear(g_c), s	0.3	19.7	8.5	5.3	12.6	12.7	21.0	3.2	6.8	7.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	0.57		0.07
Lane Grp Cap(c), veh/h	46	1275	508	173	775	796	419	729	559	180	0	0
V/C Ratio(X)	0.15	0.76	0.39	0.63	0.49	0.49	1.00	0.16	0.31	1.01	0.00	0.00
Avail Cap(c_a), veh/h	639	1848	737	665	952	977	419	729	559	180	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.0	23.2	19.6	35.2	16.6	16.7	30.6	16.3	17.4	38.9	0.0	0.0
Incr Delay (d2), s/veh	1.5	1.1	0.5	3.8	0.5	0.5	44.8	0.1	0.3	69.4	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	7.3	2.5	2.1	4.4	4.5	12.5	1.2	2.0	6.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.5	24.3	20.1	39.0	17.1	17.2	75.4	16.4	17.7	108.4	0.0	0.0
LnGrp LOS	D	C	C	D	B	B	F	B	B	F		
Approach Vol, veh/h		1172			882			705			182	
Approach Delay, s/veh		23.7			19.9			51.9			108.4	
Approach LOS		C			B			D			F	

Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		36.0	12.7	33.5	25.0	11.0	6.3	39.8				
Change Period (Y+Rc), s		4.9	5.7	5.7	4.9	4.9	5.7	5.7				
Max Green Setting (Gmax), s		31.1	31.6	41.0	20.1	6.1	30.3	42.3				
Max Q Clear Time (g_c+I1), s		8.8	7.3	21.7	23.0	9.0	2.3	14.7				
Green Ext Time (p_c), s		1.0	0.3	5.1	0.0	0.0	0.0	2.9				

Intersection Summary			
HCM 7th Control Delay, s/veh			34.6
HCM 7th LOS			C

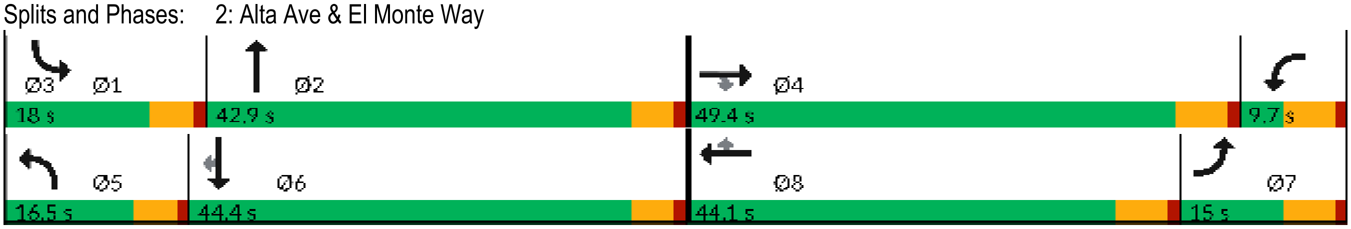
Notes
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	299	926	179	86	798	167	280	542	76	200	495	232
Future Volume (vph)	299	926	179	86	798	167	280	542	76	200	495	232
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3464	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1431	3162	3539	1432	3162	3464	0	1630	3539	1432
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			156			114		14				121
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	325	1007	195	93	867	182	304	589	83	217	538	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	325	1007	195	93	867	182	304	672	0	217	538	252
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	15.0	49.4	49.4	9.7	44.1	44.1	16.5	42.9		18.0	44.4	44.4
Total Split (%)	12.5%	41.2%	41.2%	8.1%	36.8%	36.8%	13.8%	35.8%		15.0%	37.0%	37.0%
Maximum Green (s)	9.3	43.7	43.7	4.0	38.4	38.4	11.6	38.0		13.1	39.5	39.5
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	11.2	38.9	38.9	6.4	31.8	31.8	12.7	26.3		14.2	27.9	27.9
Actuated g/C Ratio	0.11	0.39	0.39	0.06	0.32	0.32	0.13	0.26		0.14	0.28	0.28
v/c Ratio	0.92	0.73	0.30	0.46	0.77	0.34	0.76	0.73		0.94	0.55	0.52
Control Delay (s/veh)	77.5	31.2	7.6	56.7	36.5	12.8	57.4	38.0		90.3	33.0	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	77.5	31.2	7.6	56.7	36.5	12.8	57.4	38.0		90.3	33.0	19.6
LOS	E	C	A	E	D	B	E	D		F	C	B
Approach Delay (s/veh)		38.0			34.4			44.0			42.0	
Approach LOS		D			C			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 99.8	
Natural Cycle: 125	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay (s/veh): 39.2	Intersection LOS: D
Intersection Capacity Utilization 77.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	299	926	179	86	798	167	280	542	76	200	495	232
Future Volume (veh/h)	299	926	179	86	798	167	280	542	76	200	495	232
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	325	1007	195	93	867	182	304	589	83	217	538	252
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	1249	504	257	1125	454	395	787	111	241	979	395
Arrive On Green	0.12	0.35	0.35	0.08	0.32	0.32	0.12	0.25	0.24	0.15	0.28	0.28
Sat Flow, veh/h	3183	3554	1434	3183	3554	1434	3183	3119	438	1641	3554	1432
Grp Volume(v), veh/h	325	1007	195	93	867	182	304	335	337	217	538	252
Grp Sat Flow(s),veh/h/ln	1591	1777	1434	1591	1777	1434	1591	1777	1781	1641	1777	1432
Q Serve(g_s), s	9.6	24.4	6.1	2.6	21.0	5.8	8.8	16.5	16.6	12.4	12.3	10.3
Cycle Q Clear(g_c), s	9.6	24.4	6.1	2.6	21.0	5.8	8.8	16.5	16.6	12.4	12.3	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		1.00
Lane Grp Cap(c), veh/h	368	1249	504	257	1125	454	395	449	450	241	979	395
V/C Ratio(X)	0.88	0.81	0.39	0.36	0.77	0.40	0.77	0.75	0.75	0.90	0.55	0.64
Avail Cap(c_a), veh/h	368	1696	685	257	1498	604	418	727	728	241	1509	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.4	27.9	9.0	41.4	29.4	9.4	40.3	32.8	32.9	39.9	29.4	14.8
Incr Delay (d2), s/veh	21.4	2.1	0.5	0.9	1.8	0.6	8.1	2.5	2.5	32.5	0.5	1.7
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	4.6	9.6	2.8	1.0	8.3	2.8	3.7	6.8	6.9	6.8	4.9	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	62.9	30.0	9.5	42.2	31.2	10.0	48.4	35.3	35.4	72.4	29.9	16.5
LnGrp LOS	E	C	A	D	C	B	D	D	D	E	C	B
Approach Vol, veh/h		1527			1142			976			1007	
Approach Delay, s/veh		34.4			28.7			39.4			35.7	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	28.0	11.7	37.4	15.8	30.2	15.0	34.1
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	13.1	38.0	4.0	43.7	11.6	39.5	9.3	38.4
Max Q Clear Time (g_c+I1), s	14.4	18.6	4.6	26.4	10.8	14.3	11.6	23.0
Green Ext Time (p_c), s	0.0	2.3	0.0	5.1	0.1	3.4	0.0	4.2

Intersection Summary	
HCM 7th Control Delay, s/veh	34.3
HCM 7th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	38	121	280	38	94	349
Future Volume (vph)	38	121	280	38	94	349
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.982			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3476	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3476	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	132	304	41	102	379
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	132	345	0	102	379
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 28.4%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	121	280	38	94	349
Future Vol, veh/h	38	121	280	38	94	349
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	132	304	41	102	379

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	909	173	0	0	346	0
Stage 1	325	-	-	-	-	-
Stage 2	584	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	290	841	-	-	1212	-
Stage 1	705	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	265	841	-	-	1212	-
Mov Cap-2 Maneuver	265	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	510	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	12.7	0	1.75
HCM LOS	B		

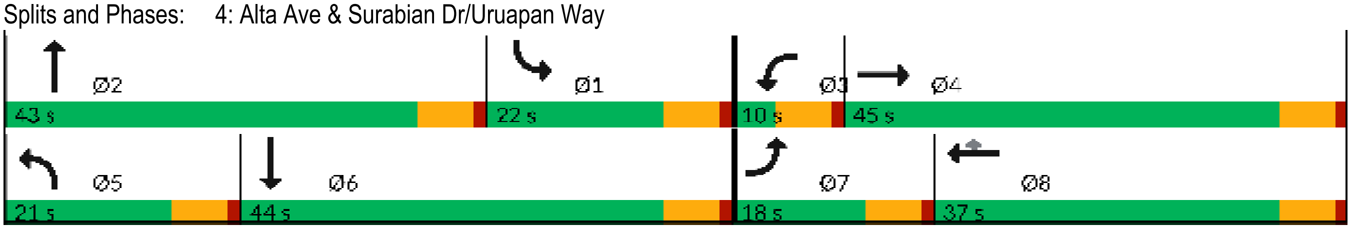
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	265	841	1212	-
HCM Lane V/C Ratio	-	-	0.156	0.156	0.084	-
HCM Control Delay (s/veh)	-	-	21.1	10.1	8.2	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.5	0.6	0.3	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	178	62	10	206	50	85	407	19	90	376	26
Future Volume (vph)	62	178	62	10	206	50	85	407	19	90	376	26
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.961				0.850		0.993			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1790	0	1630	1863	1458	1630	3514	0	1630	3504	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1790	0	1630	1863	1458	1630	3514	0	1630	3504	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				245		4			6	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	193	67	11	224	54	92	442	21	98	409	28
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	260	0	11	224	54	92	463	0	98	437	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	18.0	45.0		10.0	37.0	37.0	21.0	43.0		22.0	44.0	
Total Split (%)	15.0%	37.5%		8.3%	30.8%	30.8%	17.5%	35.8%		18.3%	36.7%	
Maximum Green (s)	12.0	39.0		4.0	31.0	31.0	15.0	37.0		16.0	38.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	9.3	28.2		4.2	17.9	17.9	10.9	39.3		11.6	40.0	
Actuated g/C Ratio	0.10	0.29		0.04	0.19	0.19	0.11	0.41		0.12	0.42	
v/c Ratio	0.42	0.48		0.15	0.64	0.11	0.50	0.32		0.50	0.30	
Control Delay (s/veh)	54.6	29.9		57.1	47.2	0.5	54.4	24.4		53.0	23.4	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	54.6	29.9		57.1	47.2	0.5	54.4	24.4		53.0	23.4	
LOS	D	C		E	D	A	D	C		D	C	
Approach Delay (s/veh)		35.0			38.8			29.4			28.8	
Approach LOS		C			D			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 95.7	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay (s/veh): 31.9	Intersection LOS: C
Intersection Capacity Utilization 53.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	178	62	10	206	50	85	407	19	90	376	26
Future Volume (veh/h)	62	178	62	10	206	50	85	407	19	90	376	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	67	193	67	11	224	54	92	442	21	98	409	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	255	89	18	284	222	116	1497	71	135	1502	102
Arrive On Green	0.05	0.19	0.19	0.01	0.15	0.15	0.07	0.43	0.43	0.08	0.45	0.45
Sat Flow, veh/h	1641	1327	461	1641	1870	1460	1641	3454	164	1641	3375	230
Grp Volume(v), veh/h	67	0	260	11	224	54	92	227	236	98	215	222
Grp Sat Flow(s),veh/h/ln	1641	0	1787	1641	1870	1460	1641	1777	1841	1641	1777	1829
Q Serve(g_s), s	3.4	0.0	11.7	0.6	9.9	2.1	4.7	7.1	7.1	5.0	6.5	6.6
Cycle Q Clear(g_c), s	3.4	0.0	11.7	0.6	9.9	2.1	4.7	7.1	7.1	5.0	6.5	6.6
Prop In Lane	1.00		0.26	1.00		1.00	1.00		0.09	1.00		0.13
Lane Grp Cap(c), veh/h	84	0	344	18	284	222	116	770	798	135	791	814
V/C Ratio(X)	0.80	0.00	0.76	0.62	0.79	0.24	0.79	0.29	0.30	0.72	0.27	0.27
Avail Cap(c_a), veh/h	231	0	816	77	679	530	288	770	798	307	791	814
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	32.6	42.1	34.9	17.3	39.1	15.7	15.7	38.2	15.0	15.0
Incr Delay (d2), s/veh	15.5	0.0	3.4	30.8	4.9	0.6	11.4	1.0	0.9	7.1	0.8	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	4.9	0.4	4.5	0.9	2.1	2.7	2.8	2.1	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	55.5	0.0	36.0	72.9	39.8	17.9	50.4	16.7	16.7	45.3	15.8	15.8
LnGrp LOS	E		D	E	D	B	D	B	B	D	B	B
Approach Vol, veh/h		327			289			555			535	
Approach Delay, s/veh		40.0			36.9			22.3			21.2	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	43.0	6.9	22.4	12.0	44.0	10.4	19.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	16.0	37.0	4.0	39.0	15.0	38.0	12.0	31.0
Max Q Clear Time (g_c+I1), s	7.0	9.1	2.6	13.7	6.7	8.6	5.4	11.9
Green Ext Time (p_c), s	0.1	2.3	0.0	1.3	0.1	2.2	0.1	1.1

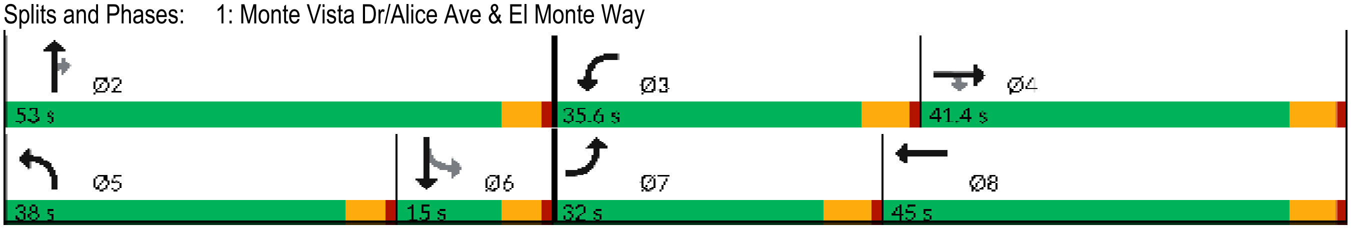
Intersection Summary	
HCM 7th Control Delay, s/veh	27.8
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	897	188	101	672	42	391	104	157	95	62	11
Future Volume (vph)	6	897	188	101	672	42	391	104	157	95	62	11
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.991				0.850		0.991	
Flt Protected	0.950			0.950			0.950				0.972	
Satd. Flow (prot)	1630	3539	1458	1630	3499	0	1630	1863	1458	0	1792	0
Flt Permitted	0.950			0.950			0.950				0.762	
Satd. Flow (perm)	1630	3539	1412	1630	3499	0	1630	1863	1430	0	1404	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			127		5				171		2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	975	204	110	730	46	425	113	171	103	67	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	975	204	110	776	0	425	113	171	0	182	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	32.0	41.4	41.4	35.6	45.0		38.0	53.0	53.0	15.0	15.0	
Total Split (%)	24.6%	31.8%	31.8%	27.4%	34.6%		29.2%	40.8%	40.8%	11.5%	11.5%	
Maximum Green (s)	26.3	35.7	35.7	29.9	39.3		33.1	48.1	48.1	10.1	10.1	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lead			Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)	7.9	36.8	36.8	15.0	53.7		34.4	53.3	53.3		14.8	
Actuated g/C Ratio	0.07	0.31	0.31	0.13	0.46		0.29	0.45	0.45		0.13	
v/c Ratio	0.06	0.88	0.38	0.53	0.48		0.89	0.13	0.23		1.02	
Control Delay (s/veh)	58.2	49.0	16.1	58.8	25.0		62.6	19.8	3.6		123.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)	58.2	49.0	16.1	58.8	25.0		62.6	19.8	3.6		123.2	
LOS	E	D	B	E	C		E	B	A		F	
Approach Delay (s/veh)		43.4			29.2			41.5			123.2	
Approach LOS		D			C			D			F	

Intersection Summary	
Area Type: Other	
Cycle Length: 130	
Actuated Cycle Length: 117.2	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay (s/veh): 43.6	Intersection LOS: D
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	897	188	101	672	42	391	104	157	95	62	11
Future Volume (veh/h)	6	897	188	101	672	42	391	104	157	95	62	11
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	7	975	204	110	730	46	425	113	171	103	67	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	40	1186	473	166	1391	88	473	827	635	142	55	10
Arrive On Green	0.02	0.33	0.33	0.10	0.41	0.39	0.29	0.44	0.44	0.11	0.11	0.10
Sat Flow, veh/h	1641	3554	1417	1641	3388	213	1641	1870	1436	744	484	87
Grp Volume(v), veh/h	7	975	204	110	383	393	425	113	171	182	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1417	1641	1777	1825	1641	1870	1436	1314	0	0
Q Serve(g_s), s	0.4	24.6	10.9	6.3	15.8	15.8	24.3	3.5	7.4	11.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	24.6	10.9	6.3	15.8	15.8	24.3	3.5	7.4	11.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	0.57		0.07
Lane Grp Cap(c), veh/h	40	1186	473	166	729	749	473	827	635	206	0	0
V/C Ratio(X)	0.17	0.82	0.43	0.66	0.52	0.53	0.90	0.14	0.27	0.88	0.00	0.00
Avail Cap(c_a), veh/h	471	1363	543	532	747	767	572	940	721	206	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.6	29.8	25.3	42.2	21.6	21.7	33.3	16.2	17.2	44.3	0.0	0.0
Incr Delay (d2), s/veh	2.0	3.7	0.6	4.5	0.6	0.6	15.1	0.1	0.2	33.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	10.0	3.4	2.6	6.0	6.2	10.7	1.4	2.2	6.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.6	33.5	25.9	46.7	22.2	22.3	48.5	16.2	17.5	77.5	0.0	0.0
LnGrp LOS	D	C	C	D	C	C	D	B	B	E		
Approach Vol, veh/h		1186			886			709			182	
Approach Delay, s/veh		32.3			25.3			35.9			77.5	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	47.1	13.9	36.6	32.1	15.0	6.4	44.0
Change Period (Y+Rc), s	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	48.1	29.9	35.7	33.1	10.1	26.3	39.3
Max Q Clear Time (g_c+I1), s	9.4	8.3	26.6	26.3	13.0	2.4	17.8
Green Ext Time (p_c), s	1.1	0.3	3.7	0.9	0.0	0.0	2.8

Intersection Summary	
HCM 7th Control Delay, s/veh	33.8
HCM 7th LOS	C

Notes

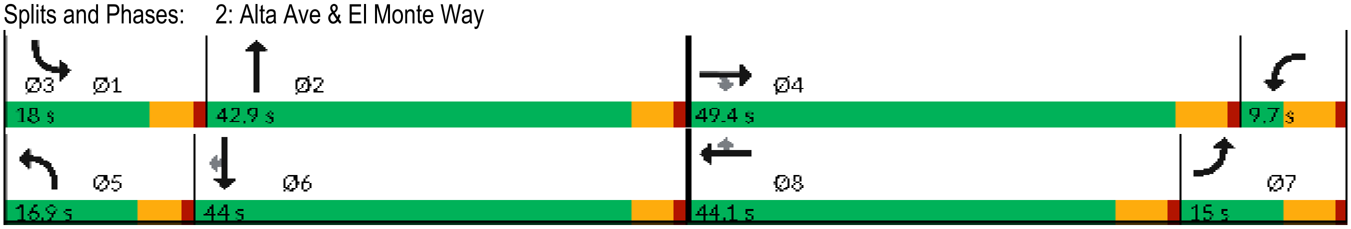
User approved pedestrian interval to be less than phase max green.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	299	926	191	95	798	167	288	544	80	200	498	232
Future Volume (vph)	299	926	191	95	798	167	288	544	80	200	498	232
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.981				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3464	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1431	3162	3539	1432	3162	3464	0	1630	3539	1432
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			167			114		14				121
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	325	1007	208	103	867	182	313	591	87	217	541	252
Shared Lane Traffic (%)												
Lane Group Flow (vph)	325	1007	208	103	867	182	313	678	0	217	541	252
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	15.0	49.4	49.4	9.7	44.1	44.1	16.9	42.9		18.0	44.0	44.0
Total Split (%)	12.5%	41.2%	41.2%	8.1%	36.8%	36.8%	14.1%	35.8%		15.0%	36.7%	36.7%
Maximum Green (s)	9.3	43.7	43.7	4.0	38.4	38.4	12.0	38.0		13.1	39.1	39.1
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	11.2	36.0	36.0	7.1	31.8	31.8	13.1	26.5		14.3	27.7	27.7
Actuated g/C Ratio	0.11	0.36	0.36	0.07	0.32	0.32	0.13	0.26		0.14	0.28	0.28
v/c Ratio	0.92	0.79	0.33	0.46	0.77	0.34	0.76	0.73		0.94	0.55	0.52
Control Delay (s/veh)	78.1	34.3	7.8	56.3	36.6	12.9	56.9	38.0		90.9	33.4	19.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	78.1	34.3	7.8	56.3	36.6	12.9	56.9	38.0		90.9	33.4	19.8
LOS	E	C	A	E	D	B	E	D		F	C	B
Approach Delay (s/veh)		40.0			34.6			44.0			42.4	
Approach LOS		D			C			D			D	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 100.1	
Natural Cycle: 125	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.94	
Intersection Signal Delay (s/veh): 40.0	Intersection LOS: D
Intersection Capacity Utilization 77.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	299	926	191	95	798	167	288	544	80	200	498	232
Future Volume (veh/h)	299	926	191	95	798	167	288	544	80	200	498	232
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	325	1007	208	103	867	182	313	591	87	217	541	252
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	367	1249	504	255	1124	453	404	787	116	241	973	392
Arrive On Green	0.12	0.35	0.35	0.08	0.32	0.32	0.13	0.25	0.24	0.15	0.27	0.27
Sat Flow, veh/h	3183	3554	1434	3183	3554	1434	3183	3099	455	1641	3554	1432
Grp Volume(v), veh/h	325	1007	208	103	867	182	313	338	340	217	541	252
Grp Sat Flow(s),veh/h/ln	1591	1777	1434	1591	1777	1434	1591	1777	1778	1641	1777	1432
Q Serve(g_s), s	9.6	24.5	6.5	2.9	21.0	5.8	9.1	16.7	16.8	12.4	12.4	10.4
Cycle Q Clear(g_c), s	9.6	24.5	6.5	2.9	21.0	5.8	9.1	16.7	16.8	12.4	12.4	10.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		1.00
Lane Grp Cap(c), veh/h	367	1249	504	255	1124	453	404	451	451	241	973	392
V/C Ratio(X)	0.89	0.81	0.41	0.40	0.77	0.40	0.77	0.75	0.75	0.90	0.56	0.64
Avail Cap(c_a), veh/h	367	1691	683	255	1494	603	430	725	725	241	1490	600
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	28.0	9.0	41.7	29.5	9.5	40.3	32.8	32.9	40.0	29.7	15.0
Incr Delay (d2), s/veh	21.9	2.1	0.5	1.0	1.8	0.6	8.1	2.5	2.6	33.1	0.5	1.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	9.6	3.0	1.1	8.4	2.8	3.8	6.9	7.0	6.9	4.9	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	63.4	30.1	9.6	42.7	31.3	10.1	48.4	35.3	35.5	73.1	30.2	16.7
LnGrp LOS	E	C	A	D	C	B	D	D	D	E	C	B
Approach Vol, veh/h		1540			1152			991			1010	
Approach Delay, s/veh		34.4			29.0			39.5			36.0	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.0	28.2	11.6	37.5	16.1	30.1	15.0	34.2
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	13.1	38.0	4.0	43.7	12.0	39.1	9.3	38.4
Max Q Clear Time (g_c+I1), s	14.4	18.8	4.9	26.5	11.1	14.4	11.6	23.0
Green Ext Time (p_c), s	0.0	2.4	0.0	5.2	0.1	3.4	0.0	4.2

Intersection Summary	
HCM 7th Control Delay, s/veh	34.5
HCM 7th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	38	128	280	38	105	349
Future Volume (vph)	38	128	280	38	105	349
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.982			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3476	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3476	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	139	304	41	114	379
Shared Lane Traffic (%)						
Lane Group Flow (vph)	41	139	345	0	114	379
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 28.6%	ICU Level of Service A
Analysis Period (min) 15	

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	128	280	38	105	349
Future Vol, veh/h	38	128	280	38	105	349
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	139	304	41	114	379

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	933	173	0	0	346	0
Stage 1	325	-	-	-	-	-
Stage 2	608	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	280	841	-	-	1212	-
Stage 1	705	-	-	-	-	-
Stage 2	543	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	254	841	-	-	1212	-
Mov Cap-2 Maneuver	254	-	-	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	491	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s/v	12.83		0		1.91	
HCM LOS	B					

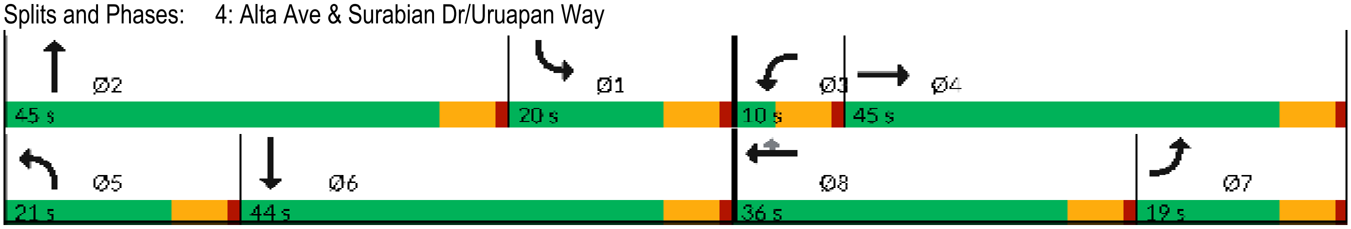
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	254	841	1212	-
HCM Lane V/C Ratio	-	-	0.163	0.165	0.094	-
HCM Control Delay (s/veh)	-	-	21.9	10.1	8.3	-
HCM Lane LOS	-	-	C	B	A	-
HCM 95th %tile Q(veh)	-	-	0.6	0.6	0.3	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	76	178	69	10	206	50	97	407	19	90	376	50
Future Volume (vph)	76	178	69	10	206	50	97	407	19	90	376	50
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.958				0.850		0.993			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1785	0	1630	1863	1458	1630	3514	0	1630	3479	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1785	0	1630	1863	1458	1630	3514	0	1630	3479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		17				191		4			12	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	83	193	75	11	224	54	105	442	21	98	409	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	83	268	0	11	224	54	105	463	0	98	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	19.0	45.0		10.0	36.0	36.0	21.0	45.0		20.0	44.0	
Total Split (%)	15.8%	37.5%		8.3%	30.0%	30.0%	17.5%	37.5%		16.7%	36.7%	
Maximum Green (s)	13.0	39.0		4.0	30.0	30.0	15.0	39.0		14.0	38.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	10.2	29.2		4.2	18.2	18.2	11.5	41.1		11.0	40.7	
Actuated g/C Ratio	0.10	0.30		0.04	0.19	0.19	0.12	0.42		0.11	0.42	
v/c Ratio	0.49	0.49		0.16	0.65	0.13	0.55	0.31		0.54	0.32	
Control Delay (s/veh)	56.8	30.1		58.3	48.4	0.6	56.9	24.0		57.3	24.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	56.8	30.1		58.3	48.4	0.6	56.9	24.0		57.3	24.1	
LOS	E	C		E	D	A	E	C		E	C	
Approach Delay (s/veh)		36.4			39.8			30.1			29.9	
Approach LOS		D			D			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 120	
Actuated Cycle Length: 97.9	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay (s/veh): 32.9	Intersection LOS: C
Intersection Capacity Utilization 54.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	178	69	10	206	50	97	407	19	90	376	50
Future Volume (veh/h)	76	178	69	10	206	50	97	407	19	90	376	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	83	193	75	11	224	54	105	442	21	98	409	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	261	101	18	281	220	132	1520	72	123	1373	180
Arrive On Green	0.06	0.20	0.20	0.01	0.15	0.15	0.08	0.44	0.44	0.08	0.43	0.43
Sat Flow, veh/h	1641	1282	498	1641	1870	1460	1641	3454	164	1641	3158	414
Grp Volume(v), veh/h	83	0	268	11	224	54	105	227	236	98	229	234
Grp Sat Flow(s),veh/h/ln	1641	0	1781	1641	1870	1460	1641	1777	1841	1641	1777	1796
Q Serve(g_s), s	4.4	0.0	12.5	0.6	10.2	2.9	5.6	7.3	7.3	5.2	7.4	7.5
Cycle Q Clear(g_c), s	4.4	0.0	12.5	0.6	10.2	2.9	5.6	7.3	7.3	5.2	7.4	7.5
Prop In Lane	1.00		0.28	1.00		1.00	1.00		0.09	1.00		0.23
Lane Grp Cap(c), veh/h	105	0	362	18	281	220	132	782	810	123	773	781
V/C Ratio(X)	0.79	0.00	0.74	0.63	0.80	0.25	0.80	0.29	0.29	0.80	0.30	0.30
Avail Cap(c_a), veh/h	241	0	784	74	633	494	278	782	810	259	773	781
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	0.0	33.1	43.7	36.3	33.2	40.1	15.9	15.9	40.3	16.2	16.3
Incr Delay (d2), s/veh	12.6	0.0	3.0	31.3	5.1	0.6	10.5	0.9	0.9	11.0	1.0	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	5.2	0.4	4.7	1.0	2.5	2.7	2.8	2.3	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.5	0.0	36.1	74.9	41.5	33.8	50.5	16.9	16.9	51.3	17.2	17.3
LnGrp LOS	D		D	E	D	C	D	B	B	D	B	B
Approach Vol, veh/h		351			289			568			561	
Approach Delay, s/veh		40.2			41.3			23.1			23.2	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	45.0	6.9	24.0	13.1	44.5	11.7	19.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	14.0	39.0	4.0	39.0	15.0	38.0	13.0	30.0
Max Q Clear Time (g_c+I1), s	7.2	9.3	2.6	14.5	7.6	9.5	6.4	12.2
Green Ext Time (p_c), s	0.1	2.3	0.0	1.3	0.1	2.3	0.1	1.1

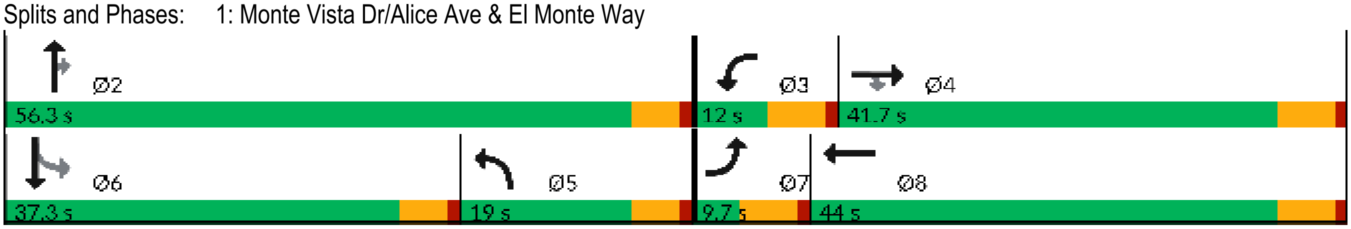
Intersection Summary	
HCM 7th Control Delay, s/veh	29.5
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	415	107	50	476	20	108	22	34	91	34	4
Future Volume (vph)	0	415	107	50	476	20	108	22	34	91	34	4
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.994				0.850		0.996	
Flt Protected				0.950			0.950				0.966	
Satd. Flow (prot)	1716	3539	1458	1630	3513	0	1630	1863	1458	0	1791	0
Flt Permitted				0.950			0.950				0.778	
Satd. Flow (perm)	1716	3539	1415	1630	3513	0	1630	1863	1431	0	1443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		4				83		1	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	451	116	54	517	22	117	24	37	99	37	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	451	116	54	539	0	117	24	37	0	140	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	9.7	41.7	41.7	12.0	44.0		19.0	56.3	56.3	37.3	37.3	
Total Split (%)	8.8%	37.9%	37.9%	10.9%	40.0%		17.3%	51.2%	51.2%	33.9%	33.9%	
Maximum Green (s)	4.0	36.0	36.0	6.3	38.3		14.1	51.4	51.4	32.4	32.4	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag			Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)		19.4	19.4	9.5	25.4		12.3	27.5	27.5		15.6	
Actuated g/C Ratio		0.31	0.31	0.15	0.40		0.20	0.44	0.44		0.25	
v/c Ratio		0.41	0.22	0.22	0.38		0.37	0.03	0.05		0.39	
Control Delay (s/veh)		21.9	5.6	37.6	15.0		34.4	12.6	0.1		28.0	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)		21.9	5.6	37.6	15.0		34.4	12.6	0.1		28.0	
LOS		C	A	D	B		C	B	A		C	
Approach Delay (s/veh)		18.5			17.0			24.4			28.0	
Approach LOS		B			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 110	
Actuated Cycle Length: 62.8	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay (s/veh): 19.5	Intersection LOS: B
Intersection Capacity Utilization 43.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	415	107	50	476	20	108	22	34	91	34	4
Future Volume (veh/h)	0	415	107	50	476	20	108	22	34	91	34	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	0	451	116	54	517	22	117	24	37	99	37	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	969	386	132	1526	65	180	722	554	309	98	8
Arrive On Green	0.00	0.27	0.27	0.08	0.44	0.40	0.11	0.39	0.39	0.19	0.19	0.17
Sat Flow, veh/h	1641	3554	1414	1641	3468	147	1641	1870	1435	927	517	42
Grp Volume(v), veh/h	0	451	116	54	264	275	117	24	37	140	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1414	1641	1777	1839	1641	1870	1435	1487	0	0
Q Serve(g_s), s	0.0	4.9	1.5	1.4	4.5	4.5	3.1	0.4	0.7	2.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	4.9	1.5	1.4	4.5	4.5	3.1	0.4	0.7	3.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	0.71		0.03
Lane Grp Cap(c), veh/h	4	969	386	132	782	809	180	722	554	416	0	0
V/C Ratio(X)	0.00	0.47	0.30	0.41	0.34	0.34	0.65	0.03	0.07	0.34	0.00	0.00
Avail Cap(c_a), veh/h	203	2912	1158	285	1545	1599	535	2126	1631	1189	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	13.9	3.4	20.1	8.5	8.5	19.6	8.8	8.9	16.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.4	2.0	0.3	0.2	3.9	0.0	0.1	0.5	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.4	0.7	0.5	1.0	1.1	1.1	0.1	0.2	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	14.3	3.9	22.2	8.7	8.8	23.6	8.8	8.9	17.0	0.0	0.0
LnGrp LOS		B	A	C	A	A	C	A	A	B		
Approach Vol, veh/h		567			593			178			140	
Approach Delay, s/veh		12.2			10.0			18.5			17.0	
Approach LOS		B			A			B			B	

Timer - Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		21.8	7.7	16.5	9.0	12.7	0.0	24.2
Change Period (Y+Rc), s		4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s		51.4	6.3	36.0	14.1	32.4	4.0	38.3
Max Q Clear Time (g_c+I1), s		2.7	3.4	6.9	5.1	5.7	0.0	6.5
Green Ext Time (p_c), s		0.2	0.0	2.4	0.2	0.4	0.0	1.9

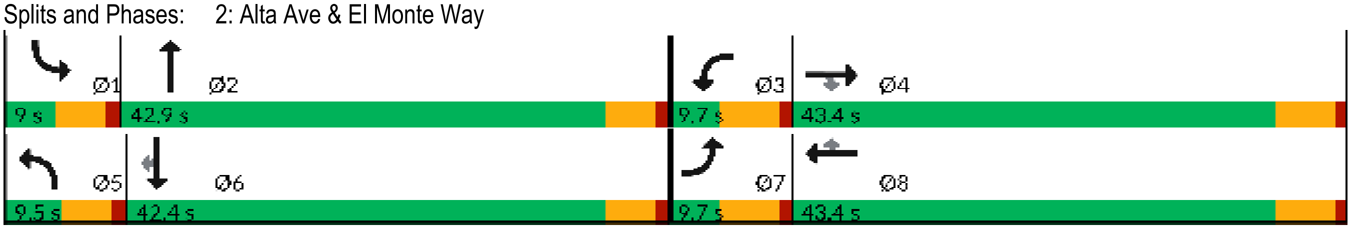
Intersection Summary	
HCM 7th Control Delay, s/veh	12.5
HCM 7th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	417	106	50	377	62	137	244	32	114	285	143
Future Volume (vph)	114	417	106	50	377	62	137	244	32	114	285	143
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.982				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3469	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1432	3162	3539	1433	3162	3469	0	1630	3539	1433
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			130		15				155
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	453	115	54	410	67	149	265	35	124	310	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	453	115	54	410	67	149	300	0	124	310	155
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	9.7	43.4	43.4	9.7	43.4	43.4	9.5	42.9		9.0	42.4	42.4
Total Split (%)	9.2%	41.3%	41.3%	9.2%	41.3%	41.3%	9.0%	40.9%		8.6%	40.4%	40.4%
Maximum Green (s)	4.0	37.7	37.7	4.0	37.7	37.7	4.6	38.0		4.1	37.5	37.5
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	6.2	21.9	21.9	6.2	16.9	16.9	6.0	15.1		5.5	14.6	14.6
Actuated g/C Ratio	0.10	0.36	0.36	0.10	0.28	0.28	0.10	0.25		0.09	0.24	0.24
v/c Ratio	0.39	0.36	0.19	0.17	0.42	0.14	0.48	0.35		0.86	0.37	0.34
Control Delay (s/veh)	35.8	17.5	4.2	33.4	19.6	0.6	37.9	19.1		80.0	20.6	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	35.8	17.5	4.2	33.4	19.6	0.6	37.9	19.1		80.0	20.6	6.2
LOS	D	B	A	C	B	A	D	B		F	C	A
Approach Delay (s/veh)		18.6			18.6			25.3			29.3	
Approach LOS		B			B			C			C	

Intersection Summary	
Area Type:	Other
Cycle Length: 105	
Actuated Cycle Length: 61.2	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay (s/veh): 22.7	Intersection LOS: C
Intersection Capacity Utilization 49.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	417	106	50	377	62	137	244	32	114	285	143
Future Volume (veh/h)	114	417	106	50	377	62	137	244	32	114	285	143
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	124	453	115	54	410	67	149	265	35	124	310	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	321	978	394	245	893	360	295	697	91	167	818	329
Arrive On Green	0.10	0.28	0.28	0.08	0.25	0.25	0.09	0.22	0.20	0.10	0.23	0.23
Sat Flow, veh/h	3183	3554	1432	3183	3554	1431	3183	3151	411	1641	3554	1430
Grp Volume(v), veh/h	124	453	115	54	410	67	149	148	152	124	310	155
Grp Sat Flow(s),veh/h/ln	1591	1777	1432	1591	1777	1431	1591	1777	1786	1641	1777	1430
Q Serve(g_s), s	1.8	5.2	3.1	0.8	4.8	1.8	2.2	3.5	3.6	3.6	3.6	4.6
Cycle Q Clear(g_c), s	1.8	5.2	3.1	0.8	4.8	1.8	2.2	3.5	3.6	3.6	3.6	4.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.23	1.00		1.00
Lane Grp Cap(c), veh/h	321	978	394	245	893	360	295	393	395	167	818	329
V/C Ratio(X)	0.39	0.46	0.29	0.22	0.46	0.19	0.50	0.38	0.38	0.74	0.38	0.47
Avail Cap(c_a), veh/h	369	2844	1146	369	2844	1146	356	1404	1411	167	2772	1116
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.7	14.8	14.1	21.3	15.6	14.5	21.3	16.3	16.4	21.5	16.0	16.4
Incr Delay (d2), s/veh	0.8	0.3	0.4	0.4	0.4	0.2	1.3	0.6	0.6	16.5	0.3	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	0.8	0.3	1.5	0.5	0.7	1.1	1.2	1.9	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	21.5	15.2	14.5	21.8	16.0	14.7	22.6	16.9	17.0	37.9	16.3	17.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	D	B	B
Approach Vol, veh/h		692			531			449			589	
Approach Delay, s/veh		16.2			16.4			18.8			21.1	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	14.9	7.8	17.5	8.6	15.3	9.0	16.4
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	4.1	38.0	4.0	37.7	4.6	37.5	4.0	37.7
Max Q Clear Time (g_c+I1), s	5.6	5.6	2.8	7.2	4.2	6.6	3.8	6.8
Green Ext Time (p_c), s	0.0	1.0	0.0	2.4	0.0	1.9	0.0	2.0

Intersection Summary			
HCM 7th Control Delay, s/veh			18.0
HCM 7th LOS			B

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	22	62	80	7	46	79
Future Volume (vph)	22	62	80	7	46	79
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.987			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3493	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3493	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	67	87	8	50	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	67	95	0	50	86
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 19.4%		ICU Level of Service A
Analysis Period (min) 15		

Intersection						
Int Delay, s/veh	3.8					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	62	80	7	46	79
Future Vol, veh/h	22	62	80	7	46	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	67	87	8	50	86

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	277	47	0	0	95	0
Stage 1	91	-	-	-	-	-
Stage 2	186	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	701	1012	-	-	1498	-
Stage 1	923	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	678	1012	-	-	1498	-
Mov Cap-2 Maneuver	678	-	-	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	817	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	9.25	0	2.75
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	678	1012	1498	-
HCM Lane V/C Ratio	-	-	0.035	0.067	0.033	-
HCM Control Delay (s/veh)	-	-	10.5	8.8	7.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.2	0.1	-

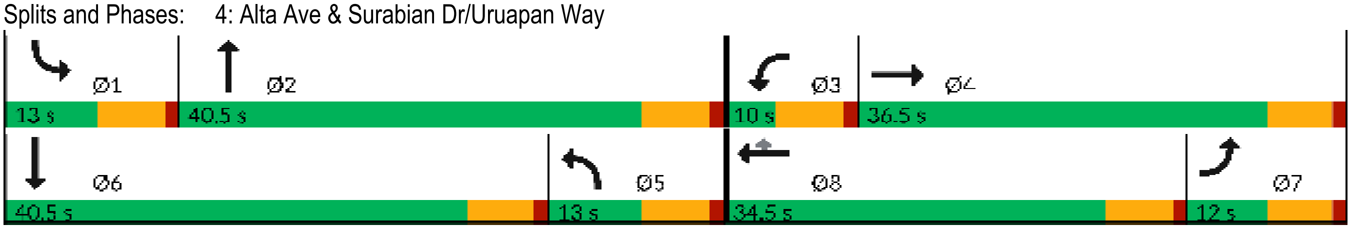
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	36	26	14	59	42	43	137	8	39	185	21
Future Volume (vph)	23	36	26	14	59	42	43	137	8	39	185	21
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.937				0.850		0.991			0.985	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1745	0	1630	1863	1458	1630	3507	0	1630	3486	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1745	0	1630	1863	1458	1630	3507	0	1630	3486	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28				229		7			13	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	39	28	15	64	46	47	149	9	42	201	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	25	67	0	15	64	46	47	158	0	42	224	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	12.0	36.5		10.0	34.5	34.5	13.0	40.5		13.0	40.5	
Total Split (%)	12.0%	36.5%		10.0%	34.5%	34.5%	13.0%	40.5%		13.0%	40.5%	
Maximum Green (s)	6.0	30.5		4.0	28.5	28.5	7.0	34.5		7.0	34.5	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	6.1	12.9		4.2	10.5	10.5	6.8	42.2		6.8	42.2	
Actuated g/C Ratio	0.09	0.18		0.06	0.15	0.15	0.09	0.59		0.09	0.59	
v/c Ratio	0.18	0.20		0.16	0.24	0.11	0.31	0.08		0.27	0.11	
Control Delay (s/veh)	41.4	17.6		44.6	30.6	0.5	42.3	13.5		41.7	13.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	41.4	17.6		44.6	30.6	0.5	42.3	13.5		41.7	13.0	
LOS	D	B		D	C	A	D	B		D	B	
Approach Delay (s/veh)		24.1			21.2			20.1			17.5	
Approach LOS		C			C			C			B	

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 71.6
Natural Cycle: 95
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.31
Intersection Signal Delay (s/veh): 19.8 Intersection LOS: B
Intersection Capacity Utilization 32.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	36	26	14	59	42	43	137	8	39	185	21
Future Volume (veh/h)	23	36	26	14	59	42	43	137	8	39	185	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	25	39	28	15	64	46	47	149	9	42	201	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	75	54	24	124	97	57	1769	106	53	1663	188
Arrive On Green	0.02	0.07	0.07	0.01	0.07	0.07	0.03	0.52	0.52	0.03	0.52	0.52
Sat Flow, veh/h	1641	1013	727	1641	1870	1460	1641	3406	204	1641	3218	364
Grp Volume(v), veh/h	25	0	67	15	64	46	47	77	81	42	110	114
Grp Sat Flow(s),veh/h/ln	1641	0	1740	1641	1870	1460	1641	1777	1834	1641	1777	1805
Q Serve(g_s), s	1.0	0.0	2.5	0.6	2.2	1.6	1.9	1.5	1.5	1.7	2.1	2.2
Cycle Q Clear(g_c), s	1.0	0.0	2.5	0.6	2.2	1.6	1.9	1.5	1.5	1.7	2.1	2.2
Prop In Lane	1.00		0.42	1.00		1.00	1.00		0.11	1.00		0.20
Lane Grp Cap(c), veh/h	36	0	129	24	124	97	57	923	952	53	918	933
V/C Ratio(X)	0.69	0.00	0.52	0.63	0.51	0.47	0.82	0.08	0.08	0.79	0.12	0.12
Avail Cap(c_a), veh/h	147	0	795	98	799	623	172	923	952	172	918	933
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	29.8	32.7	30.1	17.9	32.0	8.1	8.1	32.1	8.3	8.3
Incr Delay (d2), s/veh	20.3	0.0	3.2	24.1	3.3	3.6	24.1	0.2	0.2	22.2	0.3	0.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	1.0	0.4	1.0	0.7	1.1	0.4	0.5	0.9	0.6	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.7	0.0	33.0	56.8	33.4	21.5	56.1	8.2	8.2	54.3	8.6	8.6
LnGrp LOS	D		C	E	C	C	E	A	A	D	A	A
Approach Vol, veh/h		92			125			205			266	
Approach Delay, s/veh		38.3			31.8			19.2			15.8	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	40.7	7.0	10.9	8.3	40.5	7.5	10.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	7.0	34.5	4.0	30.5	7.0	34.5	6.0	28.5
Max Q Clear Time (g_c+I1), s	3.7	3.5	2.6	4.5	3.9	4.2	3.0	4.2
Green Ext Time (p_c), s	0.0	0.7	0.0	0.2	0.0	1.0	0.0	0.4

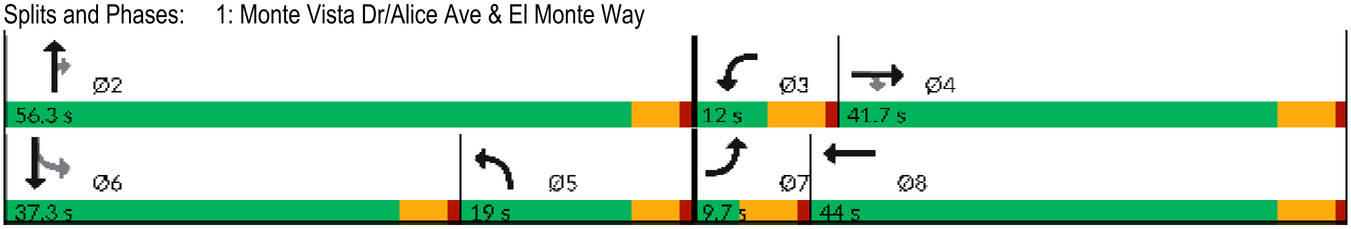
Intersection Summary	
HCM 7th Control Delay, s/veh	22.7
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	417	109	50	483	20	115	22	34	91	34	4
Future Volume (vph)	0	417	109	50	483	20	115	22	34	91	34	4
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.994				0.850		0.996	
Flt Protected				0.950			0.950				0.966	
Satd. Flow (prot)	1716	3539	1458	1630	3513	0	1630	1863	1458	0	1791	0
Flt Permitted				0.950			0.950				0.778	
Satd. Flow (perm)	1716	3539	1415	1630	3513	0	1630	1863	1431	0	1443	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124		4				83		1	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	453	118	54	525	22	125	24	37	99	37	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	453	118	54	547	0	125	24	37	0	140	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	9.7	41.7	41.7	12.0	44.0		19.0	56.3	56.3	37.3	37.3	
Total Split (%)	8.8%	37.9%	37.9%	10.9%	40.0%		17.3%	51.2%	51.2%	33.9%	33.9%	
Maximum Green (s)	4.0	36.0	36.0	6.3	38.3		14.1	51.4	51.4	32.4	32.4	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag			Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)		19.5	19.5	9.5	25.4		12.6	27.8	27.8		15.6	
Actuated g/C Ratio		0.31	0.31	0.15	0.40		0.20	0.44	0.44		0.25	
v/c Ratio		0.41	0.23	0.22	0.39		0.39	0.03	0.05		0.39	
Control Delay (s/veh)		22.0	5.8	37.8	15.2		34.6	12.6	0.1		28.2	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)		22.0	5.8	37.8	15.2		34.6	12.6	0.1		28.2	
LOS		C	A	D	B		C	B	A		C	
Approach Delay (s/veh)		18.7			17.2			24.9			28.2	
Approach LOS		B			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 110	
Actuated Cycle Length: 63.1	
Natural Cycle: 100	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.41	
Intersection Signal Delay (s/veh): 19.8	Intersection LOS: B
Intersection Capacity Utilization 43.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	417	109	50	483	20	115	22	34	91	34	4
Future Volume (veh/h)	0	417	109	50	483	20	115	22	34	91	34	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	0	453	118	54	525	22	125	24	37	99	37	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	4	967	385	131	1519	64	190	731	561	307	97	8
Arrive On Green	0.00	0.27	0.27	0.08	0.44	0.40	0.12	0.39	0.39	0.19	0.19	0.17
Sat Flow, veh/h	1641	3554	1414	1641	3471	145	1641	1870	1435	928	516	42
Grp Volume(v), veh/h	0	453	118	54	268	279	125	24	37	140	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1414	1641	1777	1839	1641	1870	1435	1486	0	0
Q Serve(g_s), s	0.0	5.0	1.6	1.5	4.7	4.7	3.4	0.4	0.8	3.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	5.0	1.6	1.5	4.7	4.7	3.4	0.4	0.8	3.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	0.71		0.03
Lane Grp Cap(c), veh/h	4	967	385	131	778	805	190	731	561	413	0	0
V/C Ratio(X)	0.00	0.47	0.31	0.41	0.35	0.35	0.66	0.03	0.07	0.34	0.00	0.00
Avail Cap(c_a), veh/h	201	2877	1145	282	1526	1580	529	2101	1612	1175	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	14.1	3.4	20.4	8.7	8.7	19.7	8.8	8.9	16.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.4	2.1	0.3	0.3	3.8	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.4	0.7	0.5	1.1	1.1	1.2	0.1	0.2	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	14.5	3.9	22.5	8.9	9.0	23.5	8.8	8.9	17.3	0.0	0.0
LnGrp LOS		B	A	C	A	A	C	A	A	B		
Approach Vol, veh/h		571			601			186			140	
Approach Delay, s/veh		12.3			10.2			18.7			17.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		22.2	7.7	16.7	9.4	12.8	0.0	24.4
Change Period (Y+Rc), s		4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s		51.4	6.3	36.0	14.1	32.4	4.0	38.3
Max Q Clear Time (g_c+I1), s		2.8	3.5	7.0	5.4	5.8	0.0	6.7
Green Ext Time (p_c), s		0.2	0.0	2.4	0.2	0.4	0.0	1.9

Intersection Summary			
HCM 7th Control Delay, s/veh			12.7
HCM 7th LOS			B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	114	417	110	53	377	62	151	247	39	114	286	143
Future Volume (vph)	114	417	110	53	377	62	151	247	39	114	286	143
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.980				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3460	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1432	3162	3539	1433	3162	3460	0	1630	3539	1433
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130			130		19				155
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	124	453	120	58	410	67	164	268	42	124	311	155
Shared Lane Traffic (%)												
Lane Group Flow (vph)	124	453	120	58	410	67	164	310	0	124	311	155
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	9.7	43.4	43.4	9.7	43.4	43.4	9.0	42.9		9.0	42.9	42.9
Total Split (%)	9.2%	41.3%	41.3%	9.2%	41.3%	41.3%	8.6%	40.9%		8.6%	40.9%	40.9%
Maximum Green (s)	4.0	37.7	37.7	4.0	37.7	37.7	4.1	38.0		4.1	38.0	38.0
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	6.2	21.8	21.8	6.2	16.8	16.8	5.5	14.6		5.5	14.6	14.6
Actuated g/C Ratio	0.10	0.36	0.36	0.10	0.28	0.28	0.09	0.24		0.09	0.24	0.24
v/c Ratio	0.38	0.36	0.20	0.18	0.42	0.14	0.58	0.37		0.84	0.37	0.34
Control Delay (s/veh)	35.5	17.3	4.5	33.2	19.4	0.6	41.2	19.1		77.6	20.3	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	35.5	17.3	4.5	33.2	19.4	0.6	41.2	19.1		77.6	20.3	6.1
LOS	D	B	A	C	B	A	D	B		E	C	A
Approach Delay (s/veh)		18.3			18.6			26.7			28.6	
Approach LOS		B			B			C			C	

Intersection Summary

Area Type: Other

Cycle Length: 105

Actuated Cycle Length: 60.7

Natural Cycle: 105

Control Type: Actuated-Uncoordinated

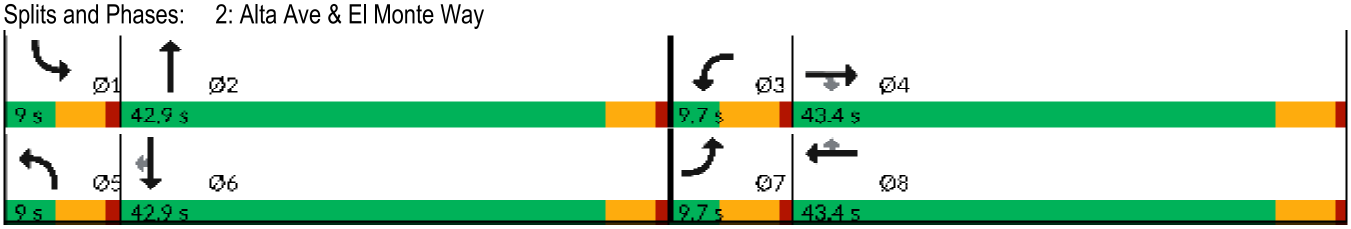
Maximum v/c Ratio: 0.84

Intersection Signal Delay (s/veh): 22.8 Intersection LOS: C

Intersection Capacity Utilization 49.3% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	417	110	53	377	62	151	247	39	114	286	143
Future Volume (veh/h)	114	417	110	53	377	62	151	247	39	114	286	143
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	124	453	120	58	410	67	164	268	42	124	311	155
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	319	966	389	250	889	358	312	697	108	165	815	328
Arrive On Green	0.10	0.27	0.27	0.08	0.25	0.25	0.10	0.23	0.21	0.10	0.23	0.23
Sat Flow, veh/h	3183	3554	1432	3183	3554	1431	3183	3074	475	1641	3554	1430
Grp Volume(v), veh/h	124	453	120	58	410	67	164	153	157	124	311	155
Grp Sat Flow(s),veh/h/ln	1591	1777	1432	1591	1777	1431	1591	1777	1773	1641	1777	1430
Q Serve(g_s), s	1.8	5.3	3.3	0.8	4.9	1.8	2.4	3.6	3.7	3.7	3.7	4.7
Cycle Q Clear(g_c), s	1.8	5.3	3.3	0.8	4.9	1.8	2.4	3.6	3.7	3.7	3.7	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	319	966	389	250	889	358	312	403	402	165	815	328
V/C Ratio(X)	0.39	0.47	0.31	0.23	0.46	0.19	0.53	0.38	0.39	0.75	0.38	0.47
Avail Cap(c_a), veh/h	365	2819	1136	365	2819	1135	320	1391	1388	165	2783	1120
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	15.1	14.4	21.5	15.8	14.6	21.3	16.3	16.4	21.7	16.2	16.5
Incr Delay (d2), s/veh	0.8	0.4	0.4	0.5	0.4	0.2	1.5	0.6	0.6	17.3	0.3	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.6	0.8	0.3	1.5	0.5	0.8	1.2	1.2	1.9	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	21.7	15.4	14.8	21.9	16.2	14.9	22.8	16.8	17.0	39.1	16.5	17.6
LnGrp LOS	C	B	B	C	B	B	C	B	B	D	B	B
Approach Vol, veh/h		697			535			474			590	
Approach Delay, s/veh		16.4			16.6			19.0			21.5	
Approach LOS		B			B			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	15.3	7.9	17.5	8.9	15.4	9.0	16.4
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	4.1	38.0	4.0	37.7	4.1	38.0	4.0	37.7
Max Q Clear Time (g_c+I1), s	5.7	5.7	2.8	7.3	4.4	6.7	3.8	6.9
Green Ext Time (p_c), s	0.0	1.0	0.0	2.4	0.0	1.9	0.0	2.0

Intersection Summary	
HCM 7th Control Delay, s/veh	18.3
HCM 7th LOS	B

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	22	74	80	7	49	79
Future Volume (vph)	22	74	80	7	49	79
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.987			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3493	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3493	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	80	87	8	53	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	24	80	95	0	53	86
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 19.6% ICU Level of Service A

Analysis Period (min) 15

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	74	80	7	49	79
Future Vol, veh/h	22	74	80	7	49	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	80	87	8	53	86

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	283	47	0	0	95	0
Stage 1	91	-	-	-	-	-
Stage 2	192	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	695	1012	-	-	1498	-
Stage 1	923	-	-	-	-	-
Stage 2	840	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	671	1012	-	-	1498	-
Mov Cap-2 Maneuver	671	-	-	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	810	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	9.25	0	2.87
HCM LOS	A		

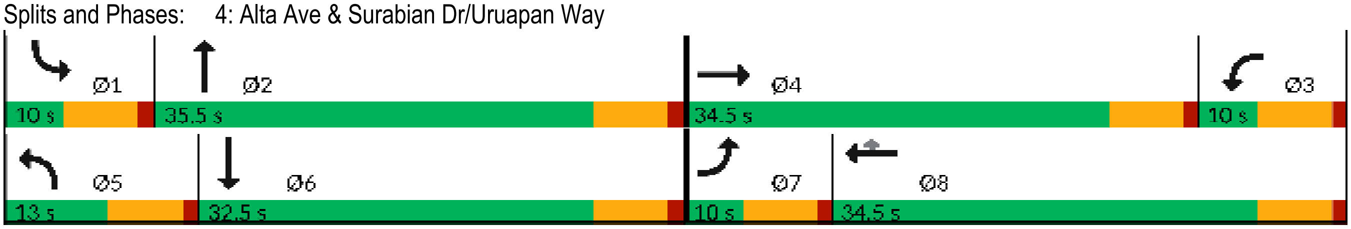
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	671	1012	1498	-
HCM Lane V/C Ratio	-	-	0.036	0.079	0.036	-
HCM Control Delay (s/veh)	-	-	10.6	8.9	7.5	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.3	0.1	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	36	38	14	59	42	47	137	8	39	185	29
Future Volume (vph)	47	36	38	14	59	42	47	137	8	39	185	29
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.923				0.850		0.991			0.979	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1719	0	1630	1863	1458	1630	3507	0	1630	3465	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1719	0	1630	1863	1458	1630	3507	0	1630	3465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		41				182		7			20	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	39	41	15	64	46	51	149	9	42	201	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	80	0	15	64	46	51	158	0	42	233	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	10.0	34.5		10.0	34.5	34.5	13.0	35.5		10.0	32.5	
Total Split (%)	11.1%	38.3%		11.1%	38.3%	38.3%	14.4%	39.4%		11.1%	36.1%	
Maximum Green (s)	4.0	28.5		4.0	28.5	28.5	7.0	29.5		4.0	26.5	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lead		Lag	Lag	Lag	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	4.2	16.6		4.2	10.4	10.4	6.7	36.3		4.2	34.7	
Actuated g/C Ratio	0.06	0.25		0.06	0.15	0.15	0.10	0.54		0.06	0.51	
v/c Ratio	0.51	0.18		0.15	0.22	0.12	0.31	0.08		0.42	0.13	
Control Delay (s/veh)	56.1	13.1		39.9	27.3	0.7	38.9	14.1		50.7	14.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	56.1	13.1		39.9	27.3	0.7	38.9	14.1		50.7	14.8	
LOS	E	B		D	C	A	D	B		D	B	
Approach Delay (s/veh)		29.9			19.0			20.1			20.3	
Approach LOS		C			B			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 67.6	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay (s/veh): 21.7	Intersection LOS: C
Intersection Capacity Utilization 33.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	36	38	14	59	42	47	137	8	39	185	29
Future Volume (veh/h)	47	36	38	14	59	42	47	137	8	39	185	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	51	39	41	15	64	46	51	149	9	42	201	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	67	71	42	129	101	62	1616	97	54	1446	227
Arrive On Green	0.04	0.08	0.08	0.03	0.07	0.07	0.04	0.47	0.47	0.03	0.47	0.47
Sat Flow, veh/h	1641	835	878	1641	1870	1460	1641	3406	204	1641	3078	482
Grp Volume(v), veh/h	51	0	80	15	64	46	51	77	81	42	115	118
Grp Sat Flow(s),veh/h/ln	1641	0	1712	1641	1870	1460	1641	1777	1834	1641	1777	1784
Q Serve(g_s), s	1.9	0.0	2.8	0.6	2.1	1.9	1.9	1.5	1.5	1.6	2.3	2.3
Cycle Q Clear(g_c), s	1.9	0.0	2.8	0.6	2.1	1.9	1.9	1.5	1.5	1.6	2.3	2.3
Prop In Lane	1.00		0.51	1.00		1.00	1.00		0.11	1.00		0.27
Lane Grp Cap(c), veh/h	62	0	138	42	129	101	62	843	870	54	835	838
V/C Ratio(X)	0.83	0.00	0.58	0.36	0.50	0.46	0.83	0.09	0.09	0.77	0.14	0.14
Avail Cap(c_a), veh/h	106	0	785	106	857	669	185	843	870	106	835	838
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.7	0.0	27.6	29.8	27.9	27.8	29.7	9.0	9.0	29.8	9.3	9.4
Incr Delay (d2), s/veh	23.0	0.0	3.8	5.0	2.9	3.2	23.0	0.2	0.2	20.2	0.3	0.4
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	1.1	0.0	1.1	0.3	0.9	0.7	1.1	0.5	0.5	0.9	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	52.7	0.0	31.3	34.8	30.9	31.1	52.7	9.2	9.2	50.0	9.7	9.7
LnGrp LOS	D		C	C	C	C	D	A	A	D	A	A
Approach Vol, veh/h		131			125			209			275	
Approach Delay, s/veh		39.7			31.4			19.8			15.9	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	35.5	7.6	11.0	8.3	35.2	8.3	10.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	4.0	29.5	4.0	28.5	7.0	26.5	4.0	28.5
Max Q Clear Time (g_c+I1), s	3.6	3.5	2.6	4.8	3.9	4.3	3.9	4.1
Green Ext Time (p_c), s	0.0	0.7	0.0	0.3	0.0	1.0	0.0	0.4

Intersection Summary	
HCM 7th Control Delay, s/veh	23.8
HCM 7th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	615	131	72	685	29	167	52	52	129	68	6
Future Volume (vph)	0	615	131	72	685	29	167	52	52	129	68	6
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.994				0.850		0.996	
Flt Protected				0.950			0.950				0.969	
Satd. Flow (prot)	1716	3539	1458	1630	3513	0	1630	1863	1458	0	1797	0
Flt Permitted				0.950			0.950				0.774	
Satd. Flow (perm)	1716	3539	1415	1630	3513	0	1630	1863	1431	0	1435	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			142		4				83		2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	668	142	78	745	32	182	57	57	140	74	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	668	142	78	777	0	182	57	57	0	221	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	9.7	41.7	41.7	11.0	43.0		20.0	57.3	57.3	37.3	37.3	
Total Split (%)	8.8%	37.9%	37.9%	10.0%	39.1%		18.2%	52.1%	52.1%	33.9%	33.9%	
Maximum Green (s)	4.0	36.0	36.0	5.3	37.3		15.1	52.4	52.4	32.4	32.4	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag			Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)		24.2	24.2	7.5	32.4		14.7	38.7	38.7		19.7	
Actuated g/C Ratio		0.30	0.30	0.09	0.41		0.18	0.49	0.49		0.25	
v/c Ratio		0.62	0.27	0.51	0.54		0.60	0.06	0.08		0.62	
Control Delay (s/veh)		28.2	6.0	54.5	19.8		44.4	13.2	1.8		36.9	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)		28.2	6.0	54.5	19.8		44.4	13.2	1.8		36.9	
LOS		C	A	D	B		D	B	A		D	
Approach Delay (s/veh)		24.3			23.0			30.2			36.9	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 79.7

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

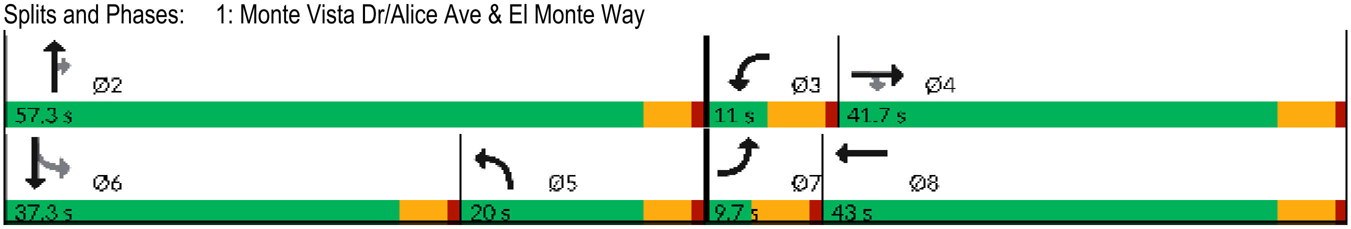
Maximum v/c Ratio: 0.62

Intersection Signal Delay (s/veh): 25.9 Intersection LOS: C

Intersection Capacity Utilization 52.4% ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	615	131	72	685	29	167	52	52	129	68	6
Future Volume (veh/h)	0	615	131	72	685	29	167	52	52	129	68	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	0	668	142	78	745	32	182	57	57	140	74	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	3	1058	421	138	1535	66	245	813	624	277	125	10
Arrive On Green	0.00	0.30	0.30	0.08	0.44	0.42	0.15	0.43	0.43	0.22	0.22	0.21
Sat Flow, veh/h	1641	3554	1415	1641	3467	149	1641	1870	1436	836	556	46
Grp Volume(v), veh/h	0	668	142	78	382	395	182	57	57	221	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1415	1641	1777	1839	1641	1870	1436	1437	0	0
Q Serve(g_s), s	0.0	10.6	2.8	3.0	10.0	10.0	6.9	1.2	1.5	8.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.6	2.8	3.0	10.0	10.0	6.9	1.2	1.5	9.2	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	0.63		0.03
Lane Grp Cap(c), veh/h	3	1058	421	138	787	814	245	813	624	412	0	0
V/C Ratio(X)	0.00	0.63	0.34	0.57	0.49	0.49	0.74	0.07	0.09	0.54	0.00	0.00
Avail Cap(c_a), veh/h	143	2050	816	176	1060	1097	402	1525	1171	821	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	19.8	5.2	28.8	12.9	13.0	26.6	10.8	10.9	23.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.5	3.6	0.5	0.4	4.4	0.0	0.1	1.1	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.7	1.3	1.2	3.1	3.2	2.6	0.4	0.4	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	20.5	5.7	32.4	13.4	13.4	31.0	10.8	10.9	24.3	0.0	0.0
LnGrp LOS		C	A	C	B	B	C	B	B	C		
Approach Vol, veh/h		810			855			296			221	
Approach Delay, s/veh		17.9			15.1			23.2			24.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs		2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s		32.4	9.5	23.5	13.8	18.6	0.0	32.9
Change Period (Y+Rc), s		4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s		52.4	5.3	36.0	15.1	32.4	4.0	37.3
Max Q Clear Time (g_c+I1), s		3.5	5.0	12.6	8.9	11.2	0.0	12.0
Green Ext Time (p_c), s		0.4	0.0	3.5	0.3	0.7	0.0	2.9

Intersection Summary			
HCM 7th Control Delay, s/veh			18.2
HCM 7th LOS			B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	602	153	75	681	93	196	495	46	166	601	208
Future Volume (vph)	164	602	153	75	681	93	196	495	46	166	601	208
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.987				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3488	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1432	3162	3539	1433	3162	3488	0	1630	3539	1433
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173			173		10				188
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	178	654	166	82	740	101	213	538	50	180	653	226
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	654	166	82	740	101	213	588	0	180	653	226
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	10.0	44.4	44.4	9.7	44.1	44.1	12.4	42.9		13.0	43.5	43.5
Total Split (%)	9.1%	40.4%	40.4%	8.8%	40.1%	40.1%	11.3%	39.0%		11.8%	39.5%	39.5%
Maximum Green (s)	4.3	38.7	38.7	4.0	38.4	38.4	7.5	38.0		8.1	38.6	38.6
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	6.2	25.9	25.9	7.8	25.0	25.0	8.9	22.6		9.3	23.0	23.0
Actuated g/C Ratio	0.08	0.32	0.32	0.10	0.31	0.31	0.11	0.28		0.12	0.29	0.29
v/c Ratio	0.72	0.57	0.29	0.27	0.67	0.18	0.60	0.59		0.95	0.64	0.41
Control Delay (s/veh)	57.5	26.5	5.2	40.1	27.5	0.8	45.2	26.9		93.8	28.2	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	57.5	26.5	5.2	40.1	27.5	0.8	45.2	26.9		93.8	28.2	8.4
LOS	E	C	A	D	C	A	D	C		F	C	A
Approach Delay (s/veh)		28.5			25.7			31.8			35.1	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other

Cycle Length: 110

Actuated Cycle Length: 79.7

Natural Cycle: 105

Control Type: Actuated-Uncoordinated

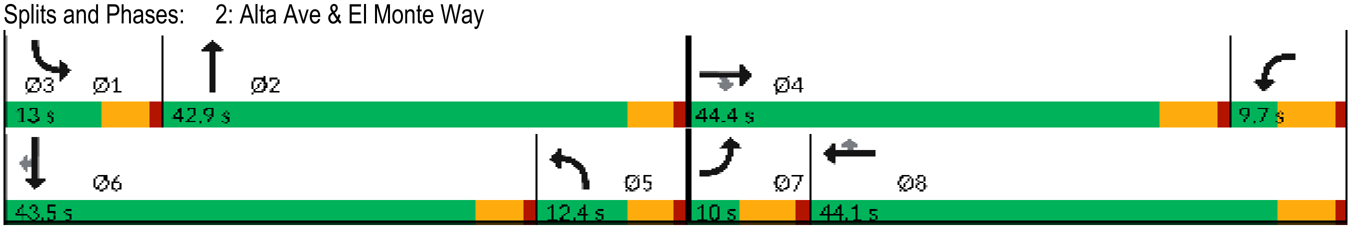
Maximum v/c Ratio: 0.95

Intersection Signal Delay (s/veh): 30.3 Intersection LOS: C

Intersection Capacity Utilization 66.8% ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	602	153	75	681	93	196	495	46	166	601	208
Future Volume (veh/h)	164	602	153	75	681	93	196	495	46	166	601	208
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	178	654	166	82	740	101	213	538	50	180	653	226
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	1007	406	345	1096	442	332	856	79	205	1001	403
Arrive On Green	0.08	0.28	0.28	0.11	0.31	0.31	0.10	0.26	0.25	0.13	0.28	0.28
Sat Flow, veh/h	3183	3554	1433	3183	3554	1433	3183	3281	304	1641	3554	1432
Grp Volume(v), veh/h	178	654	166	82	740	101	213	291	297	180	653	226
Grp Sat Flow(s),veh/h/ln	1591	1777	1433	1591	1777	1433	1591	1777	1808	1641	1777	1432
Q Serve(g_s), s	3.9	11.6	6.8	1.7	13.1	3.8	4.6	10.4	10.5	7.8	11.6	6.7
Cycle Q Clear(g_c), s	3.9	11.6	6.8	1.7	13.1	3.8	4.6	10.4	10.5	7.8	11.6	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	265	1007	406	345	1096	442	332	463	472	205	1001	403
V/C Ratio(X)	0.67	0.65	0.41	0.24	0.67	0.23	0.64	0.63	0.63	0.88	0.65	0.56
Avail Cap(c_a), veh/h	265	1995	804	345	1980	799	371	960	977	205	1950	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	22.6	20.9	29.4	21.7	18.5	30.9	23.5	23.6	30.9	22.8	10.6
Incr Delay (d2), s/veh	6.4	0.7	0.7	0.4	0.7	0.3	3.2	1.4	1.4	32.1	0.7	1.2
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	1.6	4.2	2.0	0.6	4.7	1.1	1.7	3.9	4.0	4.5	4.2	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	38.4	23.4	21.6	29.7	22.5	18.8	34.1	24.9	25.0	63.0	23.5	11.9
LnGrp LOS	D	C	C	C	C	B	C	C	C	E	C	B
Approach Vol, veh/h		998			923			801			1059	
Approach Delay, s/veh		25.7			22.7			27.4			27.7	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	22.8	11.8	24.4	11.5	24.3	10.0	26.2				
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7				
Max Green Setting (Gmax), s	8.1	38.0	4.0	38.7	7.5	38.6	4.3	38.4				
Max Q Clear Time (g_c+I1), s	9.8	12.5	3.7	13.6	6.6	13.6	5.9	15.1				
Green Ext Time (p_c), s	0.0	2.1	0.0	3.5	0.1	3.8	0.0	3.6				
Intersection Summary												
HCM 7th Control Delay, s/veh			25.9									
HCM 7th LOS			C									

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	32	91	142	18	71	186
Future Volume (vph)	32	91	142	18	71	186
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.983			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3479	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3479	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	99	154	20	77	202
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	99	174	0	77	202
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 22.1% ICU Level of Service A

Analysis Period (min) 15

Intersection						
Int Delay, s/veh	3.3					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	91	142	18	71	186
Future Vol, veh/h	32	91	142	18	71	186
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	99	154	20	77	202

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	521	87	0	0	174	0
Stage 1	164	-	-	-	-	-
Stage 2	357	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	500	955	-	-	1401	-
Stage 1	849	-	-	-	-	-
Stage 2	708	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	473	955	-	-	1401	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	669	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10.25	0	2.13
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	473	955	1401	-
HCM Lane V/C Ratio	-	-	0.074	0.104	0.055	-
HCM Control Delay (s/veh)	-	-	13.2	9.2	7.7	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.3	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	77	38	20	127	61	64	300	12	68	376	36
Future Volume (vph)	33	77	38	20	127	61	64	300	12	68	376	36
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.951				0.850		0.994			0.987	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1771	0	1630	1863	1458	1630	3518	0	1630	3493	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1771	0	1630	1863	1458	1630	3518	0	1630	3493	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		22				208		4			10	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	84	41	22	138	66	70	326	13	74	409	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	36	125	0	22	138	66	70	339	0	74	448	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	13.0	37.0		12.0	36.0	36.0	18.0	43.0		18.0	43.0	
Total Split (%)	11.8%	33.6%		10.9%	32.7%	32.7%	16.4%	39.1%		16.4%	39.1%	
Maximum Green (s)	7.0	31.0		6.0	30.0	30.0	12.0	37.0		12.0	37.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Dont Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	6.7	16.2		6.1	13.4	13.4	8.9	40.2		9.1	40.3	
Actuated g/C Ratio	0.08	0.19		0.07	0.16	0.16	0.10	0.47		0.11	0.47	
v/c Ratio	0.28	0.35		0.19	0.47	0.16	0.41	0.20		0.43	0.27	
Control Delay (s/veh)	49.1	28.3		48.4	39.3	0.9	47.7	17.8		47.9	18.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	49.1	28.3		48.4	39.3	0.9	47.7	17.8		47.9	18.0	
LOS	D	C		D	D	A	D	B		D	B	
Approach Delay (s/veh)		33.0			29.0			22.9			22.3	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 110	
Actuated Cycle Length: 85	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay (s/veh): 24.9	Intersection LOS: C
Intersection Capacity Utilization 45.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	77	38	20	127	61	64	300	12	68	376	36
Future Volume (veh/h)	33	77	38	20	127	61	64	300	12	68	376	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	36	84	41	22	138	66	70	326	13	74	409	39
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	46	138	67	32	201	157	88	1707	68	93	1617	153
Arrive On Green	0.03	0.12	0.12	0.02	0.11	0.11	0.05	0.49	0.49	0.06	0.49	0.49
Sat Flow, veh/h	1641	1187	579	1641	1870	1460	1641	3484	139	1641	3280	311
Grp Volume(v), veh/h	36	0	125	22	138	66	70	166	173	74	221	227
Grp Sat Flow(s),veh/h/ln	1641	0	1766	1641	1870	1460	1641	1777	1845	1641	1777	1814
Q Serve(g_s), s	1.6	0.0	5.1	1.0	5.4	2.4	3.2	4.0	4.0	3.4	5.4	5.5
Cycle Q Clear(g_c), s	1.6	0.0	5.1	1.0	5.4	2.4	3.2	4.0	4.0	3.4	5.4	5.5
Prop In Lane	1.00		0.33	1.00		1.00	1.00		0.08	1.00		0.17
Lane Grp Cap(c), veh/h	46	0	205	32	201	157	88	870	904	93	876	895
V/C Ratio(X)	0.78	0.00	0.61	0.68	0.69	0.42	0.80	0.19	0.19	0.80	0.25	0.25
Avail Cap(c_a), veh/h	152	0	725	130	743	580	261	870	904	261	876	895
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	0.0	31.7	36.8	32.5	18.1	35.3	10.8	10.8	35.2	11.1	11.1
Incr Delay (d2), s/veh	24.2	0.0	2.9	22.7	4.1	1.8	15.1	0.5	0.5	14.2	0.7	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	2.1	0.6	2.4	1.1	1.5	1.3	1.4	1.6	1.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	60.7	0.0	34.7	59.5	36.6	19.9	50.4	11.3	11.3	49.4	11.8	11.8
LnGrp LOS	E		C	E	D	B	D	B	B	D	B	B
Approach Vol, veh/h		161			226			409			522	
Approach Delay, s/veh		40.5			33.9			18.0			17.1	
Approach LOS		D			C			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	43.0	7.5	14.8	10.0	43.2	8.1	14.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	12.0	37.0	6.0	31.0	12.0	37.0	7.0	30.0
Max Q Clear Time (g_c+I1), s	5.4	6.0	3.0	7.1	5.2	7.5	3.6	7.4
Green Ext Time (p_c), s	0.1	1.7	0.0	0.5	0.1	2.3	0.0	0.8

Intersection Summary	
HCM 7th Control Delay, s/veh	23.1
HCM 7th LOS	C

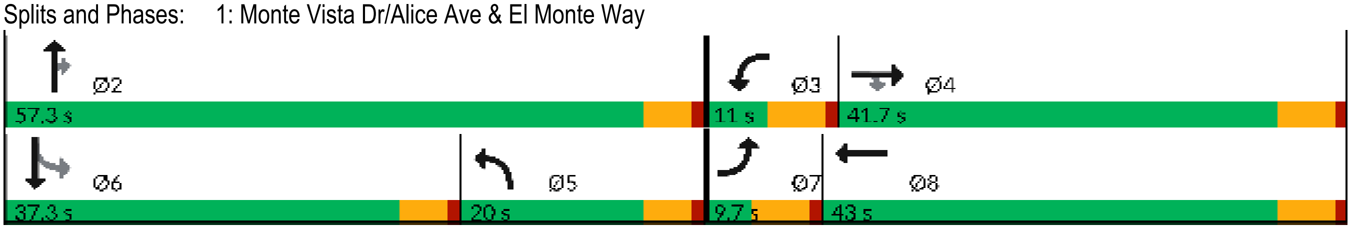
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	617	133	72	692	29	174	52	52	129	68	6
Future Volume (vph)	0	617	133	72	692	29	174	52	52	129	68	6
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	95		180	105		0	100		100	0		0
Storage Lanes	1		1	1		0	1		1	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.97		1.00				0.98		1.00	
Frt			0.850		0.994				0.850		0.996	
Flt Protected				0.950			0.950				0.969	
Satd. Flow (prot)	1716	3539	1458	1630	3513	0	1630	1863	1458	0	1797	0
Flt Permitted				0.950			0.950				0.774	
Satd. Flow (perm)	1716	3539	1415	1630	3513	0	1630	1863	1431	0	1435	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145		4				83		2	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		2696			1643			681			697	
Travel Time (s)		33.4			20.4			8.4			8.6	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	671	145	78	752	32	189	57	57	140	74	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	671	145	78	784	0	189	57	57	0	221	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1		1	1	1	1	1	
Detector Template												
Leading Detector (ft)	50	50	50	50	50		50	50	50	50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0		0	0	0	0	0	
Detector 1 Size(ft)	50	50	50	50	50		50	50	50	50	50	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases			4						2	6		
Detector Phase	7	4	4	3	8		5	2	2	6	6	
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	9.7	40.7	40.7	9.7	23.7		8.9	34.2	34.2	37.3	37.3	
Total Split (s)	9.7	41.7	41.7	11.0	43.0		20.0	57.3	57.3	37.3	37.3	
Total Split (%)	8.8%	37.9%	37.9%	10.0%	39.1%		18.2%	52.1%	52.1%	33.9%	33.9%	
Maximum Green (s)	4.0	36.0	36.0	5.3	37.3		15.1	52.4	52.4	32.4	32.4	
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7		3.9	3.9	3.9	3.9	3.9	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7		-0.9	-0.9	-0.9		-0.9	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag		Lag			Lead	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes			Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	None		None	Min	Min	Min	Min	
Walk Time (s)		7.0	7.0		7.0			7.0	7.0	7.0	7.0	
Flash Don't Walk (s)		28.0	28.0		11.0			22.3	22.3	25.4	25.4	
Pedestrian Calls (#/hr)		5	5		5			5	5	5	5	
Act Effct Green (s)		24.2	24.2	7.5	32.4		15.0	39.0	39.0		19.7	
Actuated g/C Ratio		0.30	0.30	0.09	0.41		0.19	0.49	0.49		0.25	
v/c Ratio		0.63	0.27	0.51	0.55		0.62	0.06	0.08		0.62	
Control Delay (s/veh)		28.3	6.0	54.8	20.0		44.9	13.2	1.8		37.1	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0	0.0		0.0	
Total Delay (s/veh)		28.3	6.0	54.8	20.0		44.9	13.2	1.8		37.1	
LOS		C	A	D	B		D	B	A		D	
Approach Delay (s/veh)		24.4			23.1			30.8			37.1	
Approach LOS		C			C			C			D	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 80
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay (s/veh): 26.1 Intersection LOS: C
Intersection Capacity Utilization 52.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Monte Vista Dr/Alice Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	617	133	72	692	29	174	52	52	129	68	6
Future Volume (veh/h)	0	617	133	72	692	29	174	52	52	129	68	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	0	671	145	78	752	32	189	57	57	140	74	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	1057	421	137	1531	65	252	819	629	276	124	10
Arrive On Green	0.00	0.30	0.30	0.08	0.44	0.42	0.15	0.44	0.44	0.22	0.22	0.21
Sat Flow, veh/h	1641	3554	1415	1641	3468	148	1641	1870	1436	836	554	45
Grp Volume(v), veh/h	0	671	145	78	385	399	189	57	57	221	0	0
Grp Sat Flow(s),veh/h/ln	1641	1777	1415	1641	1777	1839	1641	1870	1436	1436	0	0
Q Serve(g_s), s	0.0	10.8	2.8	3.0	10.2	10.3	7.3	1.2	1.5	8.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.8	2.8	3.0	10.2	10.3	7.3	1.2	1.5	9.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	0.63		0.03
Lane Grp Cap(c), veh/h	2	1057	421	137	784	812	252	819	629	410	0	0
V/C Ratio(X)	0.00	0.63	0.34	0.57	0.49	0.49	0.75	0.07	0.09	0.54	0.00	0.00
Avail Cap(c_a), veh/h	141	2024	806	174	1047	1084	397	1506	1156	811	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	20.1	5.2	29.2	13.2	13.2	26.8	10.8	10.9	23.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.5	3.7	0.5	0.5	4.4	0.0	0.1	1.1	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.8	1.4	1.2	3.2	3.3	2.8	0.4	0.4	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	20.8	5.7	32.8	13.7	13.7	31.2	10.8	11.0	24.7	0.0	0.0
LnGrp LOS		C	A	C	B	B	C	B	B	C		
Approach Vol, veh/h		816			862			303			221	
Approach Delay, s/veh		18.1			15.4			23.6			24.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.0	9.5	23.7	14.2	18.8	0.0	33.2
Change Period (Y+Rc), s	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	52.4	5.3	36.0	15.1	32.4	4.0	37.3
Max Q Clear Time (g_c+I1), s	3.5	5.0	12.8	9.3	11.3	0.0	12.3
Green Ext Time (p_c), s	0.4	0.0	3.5	0.3	0.7	0.0	2.9

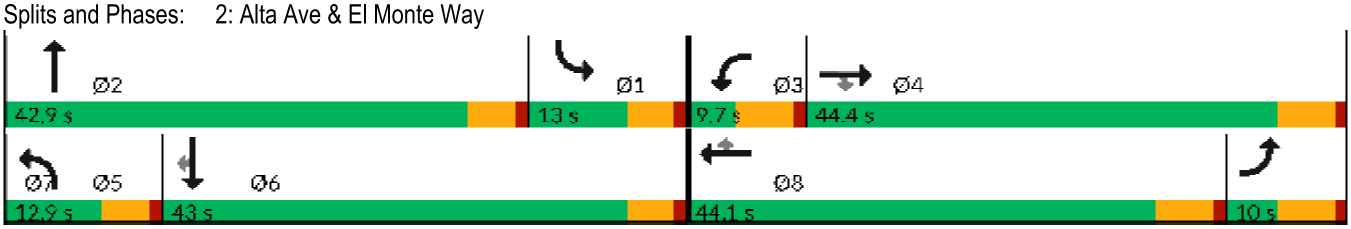
Intersection Summary	
HCM 7th Control Delay, s/veh	18.5
HCM 7th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	164	602	157	78	681	93	210	498	53	166	602	208
Future Volume (vph)	164	602	157	78	681	93	210	498	53	166	602	208
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	200		195	110		115	190		0	80		80
Storage Lanes	2		1	2		1	2		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor			0.98			0.98		1.00				0.98
Frt			0.850			0.850		0.985				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3162	3539	1458	3162	3539	1458	3162	3480	0	1630	3539	1458
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3162	3539	1432	3162	3539	1433	3162	3480	0	1630	3539	1433
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			173			173		11				188
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		1012			2084			1629			1012	
Travel Time (s)		12.5			25.8			20.2			12.5	
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			2			2			2			2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	178	654	171	85	740	101	228	541	58	180	654	226
Shared Lane Traffic (%)												
Lane Group Flow (vph)	178	654	171	85	740	101	228	599	0	180	654	226
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			24			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	1	1	1	1	1	1	1		1	1	1
Detector Template												
Leading Detector (ft)	50	50	50	50	50	50	50	50		50	50	50
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	50	50	50	50	50	50	50	50		50	50	50
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Detector Phase	7	4	4	3	8	8	5	2		1	6	6
Switch Phase												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.7	39.1	39.1	9.7	42.8	42.8	8.9	42.9		8.9	42.3	42.3
Total Split (s)	10.0	44.4	44.4	9.7	44.1	44.1	12.9	42.9		13.0	43.0	43.0
Total Split (%)	9.1%	40.4%	40.4%	8.8%	40.1%	40.1%	11.7%	39.0%		11.8%	39.1%	39.1%
Maximum Green (s)	4.3	38.7	38.7	4.0	38.4	38.4	8.0	38.0		8.1	38.1	38.1
Yellow Time (s)	4.7	4.7	4.7	4.7	4.7	4.7	3.9	3.9		3.9	3.9	3.9
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	1.0	1.0
Lost Time Adjust (s)	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7	-0.9	-0.9		-0.9	-0.9	-0.9
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None	None	None	None	None	None	Min		None	Min	Min
Walk Time (s)		7.0	7.0		7.0	7.0		7.0			7.0	7.0
Flash Don't Walk (s)		26.0	26.0		30.1	30.1		31.0			30.1	30.1
Pedestrian Calls (#/hr)		5	5		5	5		5			5	5
Act Effct Green (s)	6.2	27.8	27.8	5.9	25.0	25.0	9.2	21.6		10.8	23.2	23.2
Actuated g/C Ratio	0.08	0.35	0.35	0.07	0.31	0.31	0.11	0.27		0.13	0.29	0.29
v/c Ratio	0.73	0.53	0.28	0.37	0.67	0.18	0.63	0.63		0.83	0.64	0.41
Control Delay (s/veh)	58.2	24.3	4.9	45.3	27.8	0.8	46.2	28.7		67.8	28.1	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay (s/veh)	58.2	24.3	4.9	45.3	27.8	0.8	46.2	28.7		67.8	28.1	8.3
LOS	E	C	A	D	C	A	D	C		E	C	A
Approach Delay (s/veh)		27.0			26.4			33.5			30.6	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 110	
Actuated Cycle Length: 80.2	
Natural Cycle: 105	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay (s/veh): 29.3	Intersection LOS: C
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 2: Alta Ave & El Monte Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	602	157	78	681	93	210	498	53	166	602	208
Future Volume (veh/h)	164	602	157	78	681	93	210	498	53	166	602	208
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	178	654	171	85	740	101	228	541	58	180	654	226
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	1143	461	218	1093	441	347	812	87	227	998	402
Arrive On Green	0.08	0.32	0.32	0.07	0.31	0.31	0.11	0.25	0.24	0.14	0.28	0.28
Sat Flow, veh/h	3183	3554	1434	3183	3554	1433	3183	3231	345	1641	3554	1432
Grp Volume(v), veh/h	178	654	171	85	740	101	228	297	302	180	654	226
Grp Sat Flow(s),veh/h/ln	1591	1777	1434	1591	1777	1433	1591	1777	1800	1641	1777	1432
Q Serve(g_s), s	3.9	11.1	6.7	1.9	13.2	3.8	5.0	10.9	11.0	7.7	11.8	6.8
Cycle Q Clear(g_c), s	3.9	11.1	6.7	1.9	13.2	3.8	5.0	10.9	11.0	7.7	11.8	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.19	1.00		1.00
Lane Grp Cap(c), veh/h	263	1143	461	218	1093	441	347	446	452	227	998	402
V/C Ratio(X)	0.68	0.57	0.37	0.39	0.68	0.23	0.66	0.66	0.67	0.79	0.66	0.56
Avail Cap(c_a), veh/h	263	1976	797	250	1961	791	390	951	963	227	1907	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	20.5	19.0	32.4	22.0	18.7	31.1	24.5	24.6	30.3	23.0	10.9
Incr Delay (d2), s/veh	6.8	0.5	0.5	1.1	0.7	0.3	3.4	1.7	1.7	17.1	0.7	1.2
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	1.6	4.0	1.9	0.7	4.8	1.1	1.9	4.2	4.3	3.8	4.3	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	39.2	21.0	19.5	33.5	22.8	19.0	34.5	26.2	26.3	47.4	23.8	12.1
LnGrp LOS	D	C	B	C	C	B	C	C	C	D	C	B
Approach Vol, veh/h		1003			926			827			1060	
Approach Delay, s/veh		23.9			23.3			28.5			25.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.1	22.3	9.0	27.4	11.9	24.4	10.0	26.3
Change Period (Y+Rc), s	4.9	4.9	5.7	5.7	4.9	4.9	5.7	5.7
Max Green Setting (Gmax), s	8.1	38.0	4.0	38.7	8.0	38.1	4.3	38.4
Max Q Clear Time (g_c+I1), s	9.7	13.0	3.9	13.1	7.0	13.8	5.9	15.2
Green Ext Time (p_c), s	0.0	2.1	0.0	3.6	0.1	3.8	0.0	3.6

Intersection Summary	
HCM 7th Control Delay, s/veh	25.2
HCM 7th LOS	C

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	32	103	142	18	74	186
Future Volume (vph)	32	103	142	18	74	186
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1900
Storage Length (ft)	0	100		0	150	
Storage Lanes	1	1		0	1	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	1.00
Frt		0.850	0.983			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1630	1458	3479	0	1630	1863
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1630	1458	3479	0	1630	1863
Link Speed (mph)	55		55			55
Link Distance (ft)	522		452			482
Travel Time (s)	6.5		5.6			6.0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	35	112	154	20	80	202
Shared Lane Traffic (%)						
Lane Group Flow (vph)	35	112	174	0	80	202
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(ft)	12		12			12
Link Offset(ft)	0		0			0
Crosswalk Width(ft)	16		16			16
Two way Left Turn Lane						
Headway Factor	1.11	1.11	1.00	1.11	1.11	1.00
Turning Speed (mph)	15	9		9	15	
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 22.3%	ICU Level of Service A
Analysis Period (min) 15	

Intersection						
Int Delay, s/veh	3.5					

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	103	142	18	74	186
Future Vol, veh/h	32	103	142	18	74	186
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	100	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	35	112	154	20	80	202

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	527	87	0	0	174	0
Stage 1	164	-	-	-	-	-
Stage 2	363	-	-	-	-	-
Critical Hdwy	6.63	6.93	-	-	4.13	-
Critical Hdwy Stg 1	5.83	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	496	955	-	-	1401	-
Stage 1	849	-	-	-	-	-
Stage 2	703	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	467	955	-	-	1401	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	662	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	10.23	0	2.2
HCM LOS	B		

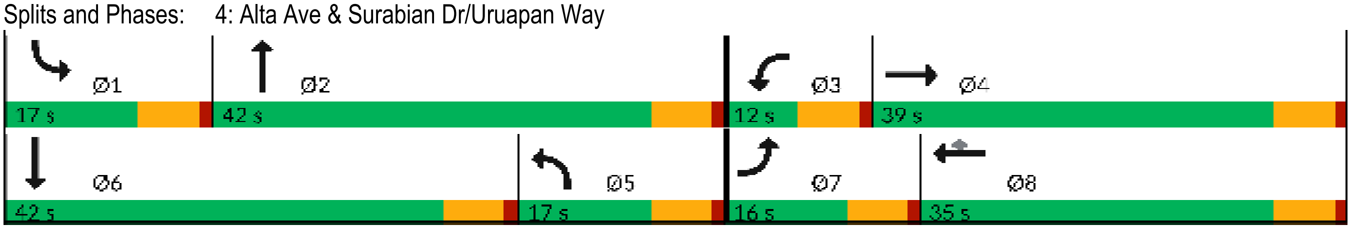
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	467	955	1401	-
HCM Lane V/C Ratio	-	-	0.074	0.117	0.057	-
HCM Control Delay (s/veh)	-	-	13.3	9.3	7.7	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.4	0.2	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	77	50	20	127	61	68	300	12	68	376	44
Future Volume (vph)	57	77	50	20	127	61	68	300	12	68	376	44
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1900	1750	1750	1900	1750
Storage Length (ft)	125		0	75		30	200		0	200		0
Storage Lanes	1		0	1		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Frt		0.941				0.850		0.994			0.984	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	1753	0	1630	1863	1458	1630	3518	0	1630	3483	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1630	1753	0	1630	1863	1458	1630	3518	0	1630	3483	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		30				208		4			12	
Link Speed (mph)		55			55			55			55	
Link Distance (ft)		353			661			1215			1629	
Travel Time (s)		4.4			8.2			15.1			20.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	84	54	22	138	66	74	326	13	74	409	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	138	0	22	138	66	74	339	0	74	457	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			24			24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11	1.11	1.00	1.11
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	7	4		3	8	8	5	2		1	6	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Minimum Split (s)	10.0	34.2		10.0	34.5	34.5	10.0	38.2		10.0	29.9	
Total Split (s)	16.0	39.0		12.0	35.0	35.0	17.0	42.0		17.0	42.0	
Total Split (%)	14.5%	35.5%		10.9%	31.8%	31.8%	15.5%	38.2%		15.5%	38.2%	
Maximum Green (s)	10.0	33.0		6.0	29.0	29.0	11.0	36.0		11.0	36.0	
Yellow Time (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0		5.0	5.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lag	Lag		Lead	Lead	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None		None	None	None	None	Max		None	Max	
Walk Time (s)		7.0			7.0	7.0		7.0			7.0	
Flash Don't Walk (s)		21.2			21.5	21.5		21.2			16.9	
Pedestrian Calls (#/hr)		5			5	5		5			5	
Act Effct Green (s)	8.4	20.7		6.1	13.7	13.7	9.0	38.7		9.0	38.7	
Actuated g/C Ratio	0.10	0.24		0.07	0.16	0.16	0.10	0.44		0.10	0.44	
v/c Ratio	0.40	0.32		0.20	0.48	0.16	0.45	0.22		0.45	0.30	
Control Delay (s/veh)	50.3	24.8		49.4	41.0	0.9	50.6	19.9		50.6	20.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay (s/veh)	50.3	24.8		49.4	41.0	0.9	50.6	19.9		50.6	20.3	
LOS	D	C		D	D	A	D	B		D	C	
Approach Delay (s/veh)		32.7			30.1			25.4			24.5	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 110	
Actuated Cycle Length: 87.8	
Natural Cycle: 95	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay (s/veh): 26.9	Intersection LOS: C
Intersection Capacity Utilization 46.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Alta Ave & Surabian Dr/Uruapan Way



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	77	50	20	127	61	68	300	12	68	376	44
Future Volume (veh/h)	57	77	50	20	127	61	68	300	12	68	376	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width 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
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	1723	1870	1723	1723	1870	1723	1723	1870	1723	1723	1870	1723
Adj Flow Rate, veh/h	62	84	54	22	138	66	74	326	13	74	409	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	77	143	92	32	201	157	93	1650	66	93	1518	177
Arrive On Green	0.05	0.13	0.13	0.02	0.11	0.11	0.06	0.47	0.47	0.06	0.47	0.47
Sat Flow, veh/h	1641	1064	684	1641	1870	1460	1641	3484	139	1641	3206	374
Grp Volume(v), veh/h	62	0	138	22	138	66	74	166	173	74	226	231
Grp Sat Flow(s),veh/h/ln	1641	0	1747	1641	1870	1460	1641	1777	1845	1641	1777	1803
Q Serve(g_s), s	2.8	0.0	5.6	1.0	5.4	3.2	3.4	4.1	4.1	3.4	5.8	5.9
Cycle Q Clear(g_c), s	2.8	0.0	5.6	1.0	5.4	3.2	3.4	4.1	4.1	3.4	5.8	5.9
Prop In Lane	1.00		0.39	1.00		1.00	1.00		0.08	1.00		0.21
Lane Grp Cap(c), veh/h	77	0	235	32	201	157	93	841	874	93	841	854
V/C Ratio(X)	0.81	0.00	0.59	0.69	0.69	0.42	0.80	0.20	0.20	0.80	0.27	0.27
Avail Cap(c_a), veh/h	216	0	758	129	713	557	237	841	874	237	841	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	0.0	30.9	37.0	32.7	31.7	35.4	11.6	11.6	35.4	12.1	12.1
Incr Delay (d2), s/veh	17.5	0.0	2.3	22.8	4.1	1.8	14.3	0.5	0.5	14.3	0.8	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	2.3	0.6	2.4	1.1	1.6	1.4	1.5	1.6	2.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	53.4	0.0	33.2	59.8	36.9	33.5	49.7	12.1	12.1	49.7	12.8	12.9
LnGrp LOS	D		C	E	D	C	D	B	B	D	B	B
Approach Vol, veh/h		200			226			413			531	
Approach Delay, s/veh		39.5			38.1			18.9			18.0	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	42.0	7.5	16.2	10.3	42.0	9.6	14.2
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	11.0	36.0	6.0	33.0	11.0	36.0	10.0	29.0
Max Q Clear Time (g_c+I1), s	5.4	6.1	3.0	7.6	5.4	7.9	4.8	7.4
Green Ext Time (p_c), s	0.1	1.6	0.0	0.6	0.1	2.3	0.0	0.8

Intersection Summary	
HCM 7th Control Delay, s/veh	24.7
HCM 7th LOS	C

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Hanford, CA 93230

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Turning Movement Report

Prepared For:
Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

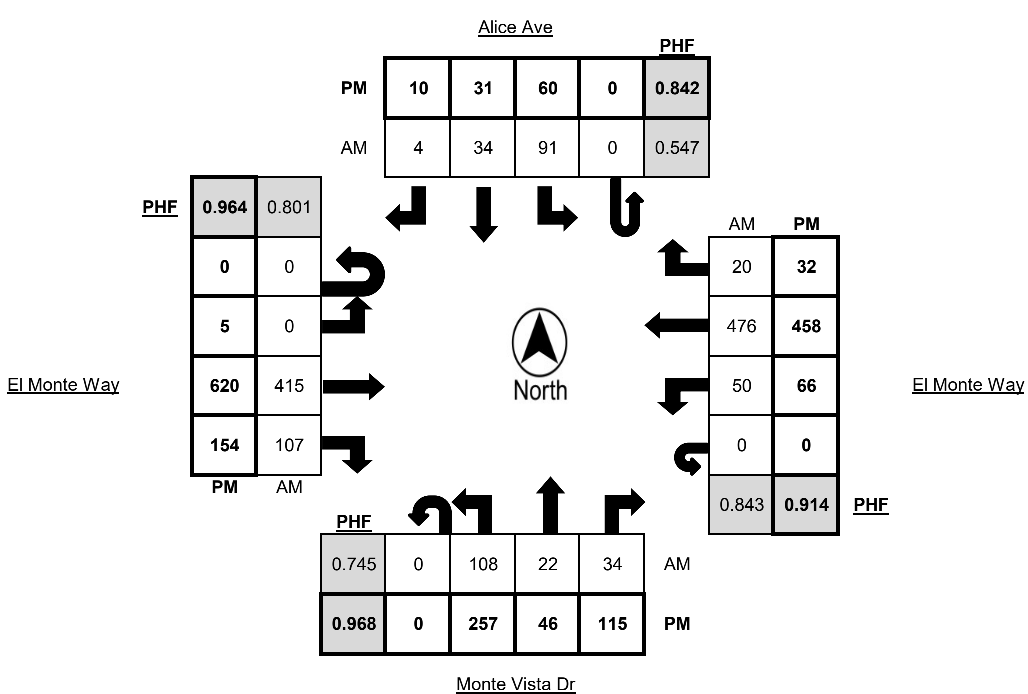
LOCATION	Monte Vista Dr @ El Monte Way	**LATITUDE**	36.5460
COUNTY	Tulare	**LONGITUDE**	-119.4041
COLLECTION DATE	Wednesday, May 29, 2024	**WEATHER**	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	9	1	3	3	0	5	4	2	0	0	1	36	15	7	0	4	73	1	2
6:15 AM - 6:30 AM	0	17	0	1	6	0	4	1	4	0	0	0	33	7	3	0	5	92	2	3
6:30 AM - 6:45 AM	0	11	0	2	1	0	6	2	1	0	0	0	33	18	7	0	10	99	2	3
6:45 AM - 7:00 AM	0	15	3	6	2	0	9	3	2	0	0	1	56	23	3	0	11	94	3	6
7:00 AM - 7:15 AM	0	30	4	5	3	0	7	5	2	0	0	0	59	18	8	0	7	103	4	12
7:15 AM - 7:30 AM	0	20	6	5	1	0	14	7	0	2	0	0	101	26	6	0	11	113	5	7
7:30 AM - 7:45 AM	0	26	2	11	3	0	27	8	0	1	0	0	136	27	0	0	10	126	5	5
7:45 AM - 8:00 AM	0	32	10	13	2	0	43	14	2	0	0	0	119	36	9	0	22	134	6	4
TOTAL	**0**	**160**	**26**	**46**	**21**	**0**	**115**	**44**	**13**	**3**	**0**	**2**	**573**	**170**	**43**	**0**	**80**	**834**	**28**	**42**

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	63	9	30	1	0	10	9	1	0	0	0	161	46	4	0	13	95	9	3
4:15 PM - 4:30 PM	0	64	10	33	3	0	13	3	3	0	0	1	164	37	6	0	9	115	9	2
4:30 PM - 4:45 PM	0	65	11	23	1	0	12	11	2	1	0	0	148	37	3	0	17	123	7	1
4:45 PM - 5:00 PM	0	64	11	29	0	0	17	10	3	1	0	1	146	49	2	0	22	96	6	5
5:00 PM - 5:15 PM	0	64	14	30	4	0	18	7	2	0	0	3	162	31	0	0	18	124	10	4
5:15 PM - 5:30 PM	0	58	8	20	1	0	20	3	1	0	0	0	145	31	3	0	13	121	6	1
5:30 PM - 5:45 PM	1	55	13	22	4	0	22	7	2	1	0	1	134	46	4	0	14	93	10	1
5:45 PM - 6:00 PM	0	54	5	15	3	0	11	8	0	0	0	1	171	42	4	0	5	100	7	2
TOTAL	**1**	**487**	**81**	**202**	**17**	**0**	**123**	**58**	**14**	**3**	**0**	**7**	**1231**	**319**	**26**	**0**	**111**	**867**	**64**	**19**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	108	22	34	9	0	91	34	4	3	0	0	415	107	23	0	50	476	20	28
4:15 PM - 5:15 PM	0	257	46	115	8	0	60	31	10	2	0	5	620	154	11	0	66	458	32	12

	PHF	Trucks
AM	0.789	4.6%
PM	0.960	1.8%



Turning Movement Report

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Prepared For:

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Bakersfield, CA 93301

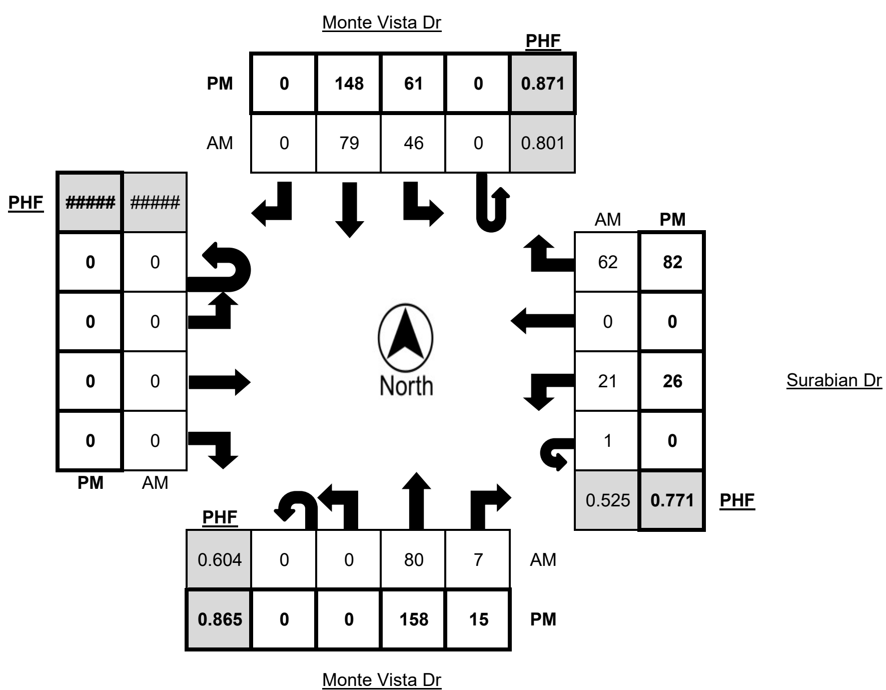
LOCATION	Monte Vista Dr @ Surabian Dr	**LATITUDE**	36.5423
COUNTY	Tulare	**LONGITUDE**	-119.4041
COLLECTION DATE	Wednesday, May 29, 2024	**WEATHER**	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	0	0	6	1	2	0	10	6	0	5	0	0	0	0	0	0	2	0	10	4
6:15 AM - 6:30 AM	0	0	5	3	1	0	3	7	0	0	0	0	0	0	0	0	5	0	6	2
6:30 AM - 6:45 AM	0	0	8	0	0	0	5	13	0	3	0	0	0	0	0	0	6	0	6	1
6:45 AM - 7:00 AM	0	0	12	1	1	0	9	15	0	3	0	0	0	0	0	0	3	0	12	2
7:00 AM - 7:15 AM	0	0	13	2	2	0	7	11	0	1	0	0	0	0	0	0	3	0	15	4
7:15 AM - 7:30 AM	0	0	17	0	0	0	12	20	0	2	0	0	0	0	0	0	4	0	8	2
7:30 AM - 7:45 AM	0	0	16	3	0	0	12	24	0	2	0	0	0	0	0	1	4	0	9	1
7:45 AM - 8:00 AM	0	0	34	2	0	0	15	24	0	3	0	0	0	0	0	0	10	0	30	2
TOTAL	**0**	**0**	**111**	**12**	**6**	**0**	**73**	**120**	**0**	**19**	**0**	**0**	**0**	**0**	**0**	**1**	**37**	**0**	**96**	**18**

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	0	40	2	2	0	19	28	0	8	0	0	0	0	0	0	3	0	17	2
4:15 PM - 4:30 PM	0	0	37	6	3	0	9	31	0	1	0	0	0	0	0	0	2	0	14	0
4:30 PM - 4:45 PM	0	0	37	1	1	0	19	41	0	2	0	0	0	0	0	0	11	0	24	1
4:45 PM - 5:00 PM	0	0	46	4	1	0	20	33	0	2	0	0	0	0	0	0	6	0	18	1
5:00 PM - 5:15 PM	0	0	39	4	1	0	11	38	0	0	0	0	0	0	0	0	4	0	22	1
5:15 PM - 5:30 PM	0	0	36	6	2	0	11	36	0	1	0	0	0	0	0	0	5	0	18	2
5:30 PM - 5:45 PM	0	0	38	4	2	0	18	16	0	2	0	0	0	0	0	0	8	0	19	1
5:45 PM - 6:00 PM	0	0	29	1	2	0	13	24	0	3	0	0	0	0	0	0	8	0	15	0
TOTAL	**0**	**0**	**302**	**28**	**14**	**0**	**120**	**247**	**0**	**19**	**0**	**0**	**0**	**0**	**0**	**0**	**47**	**0**	**147**	**8**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	0	80	7	2	0	46	79	0	8	0	0	0	0	0	1	21	0	62	9
4:30 PM - 5:30 PM	0	0	158	15	5	0	61	148	0	5	0	0	0	0	0	0	26	0	82	5

	PHF	Trucks
AM	0.643	6.4%
PM	0.921	3.1%



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

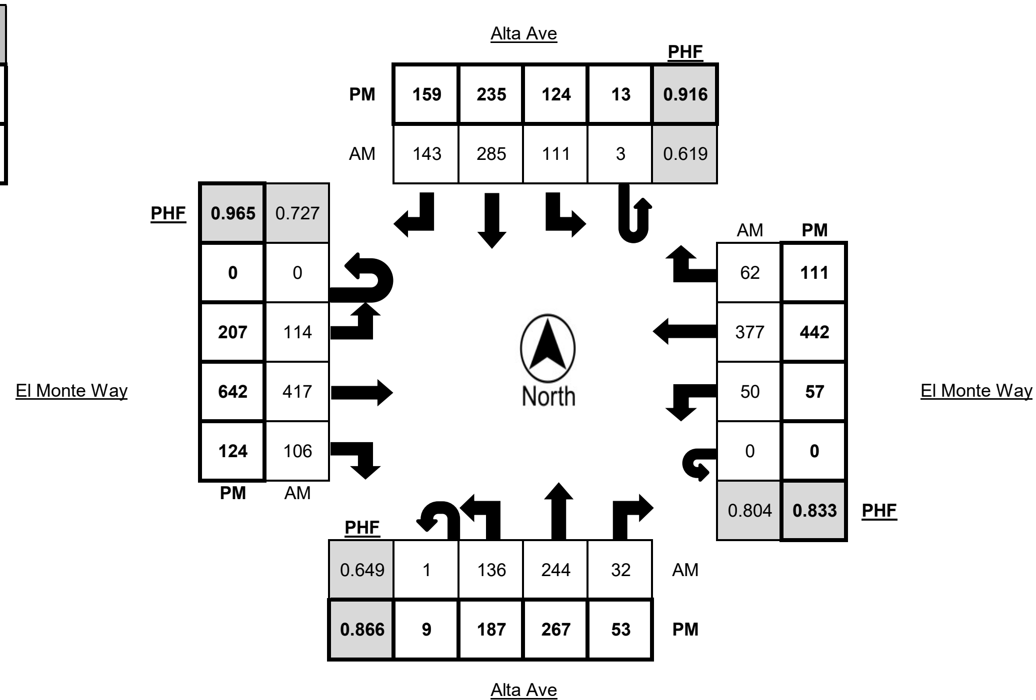
LOCATION	Alta Ave @ El Monte Wy	**LATITUDE**	36.5459
COUNTY	Tulare	**LONGITUDE**	-119.3951
COLLECTION DATE	Wednesday, May 29, 2024	**WEATHER**	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**
6:00 AM - 6:15 AM	0	18	21	4	2	0	6	39	3	3	0	8	16	14	1	0	6	57	7	2
6:15 AM - 6:30 AM	1	16	25	5	1	0	3	21	11	0	0	12	21	9	3	0	4	68	10	4
6:30 AM - 6:45 AM	0	23	26	4	3	0	8	23	15	0	0	9	29	7	4	0	12	71	13	4
6:45 AM - 7:00 AM	0	16	29	5	2	0	9	35	22	1	0	15	48	15	1	0	9	77	9	7
7:00 AM - 7:15 AM	0	25	38	6	5	1	11	36	24	2	0	16	70	17	4	0	5	86	7	8
7:15 AM - 7:30 AM	0	27	39	2	1	1	26	58	36	3	0	21	96	16	7	0	11	91	6	6
7:30 AM - 7:45 AM	1	36	72	8	2	0	26	65	39	4	0	40	109	33	3	0	17	90	24	5
7:45 AM - 8:00 AM	0	48	95	16	1	1	48	126	44	2	0	37	142	40	7	0	17	110	25	2
TOTAL	**2**	**209**	**345**	**50**	**17**	**3**	**137**	**403**	**194**	**15**	**0**	**158**	**531**	**151**	**30**	**0**	**81**	**650**	**101**	**38**

	Northbound					Southbound					Eastbound					Westbound				
Time	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	1	55	59	15	4	4	31	60	40	1	0	60	151	34	5	0	11	99	20	3
4:15 PM - 4:30 PM	2	51	55	15	1	1	29	58	40	3	0	56	138	28	3	0	9	126	28	4
4:30 PM - 4:45 PM	4	37	85	23	1	5	31	57	29	1	0	57	151	32	3	0	19	135	29	1
4:45 PM - 5:00 PM	3	44	62	12	2	2	28	54	46	2	0	57	151	32	3	0	12	93	29	3
5:00 PM - 5:15 PM	1	59	73	9	5	1	36	55	42	1	0	41	179	32	4	0	15	105	24	1
5:15 PM - 5:30 PM	1	47	47	9	0	5	29	69	42	0	0	52	161	28	5	0	11	109	29	0
5:30 PM - 5:45 PM	2	51	72	9	1	3	33	55	41	0	1	63	162	33	2	0	15	93	34	1
5:45 PM - 6:00 PM	3	36	51	9	1	1	41	52	42	2	0	49	161	36	4	0	11	101	27	0
TOTAL	**17**	**380**	**504**	**101**	**15**	**22**	**258**	**460**	**322**	**10**	**1**	**435**	**1254**	**255**	**29**	**0**	**103**	**861**	**220**	**13**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**	**U-Turn**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	1	136	244	32	9	3	111	285	143	11	0	114	417	106	21	0	50	377	62	21
4:30 PM - 5:30 PM	9	187	267	53	8	13	124	235	159	4	0	207	642	124	15	0	57	442	111	5

	PHF	**Trucks**
AM	0.695	3.0%
PM	0.947	1.2%



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Turning Movement Report

Prepared For:
Ruettgers & Schuler Civil Engineers
1800 30th St, Ste 260
Bakersfield, CA 93301

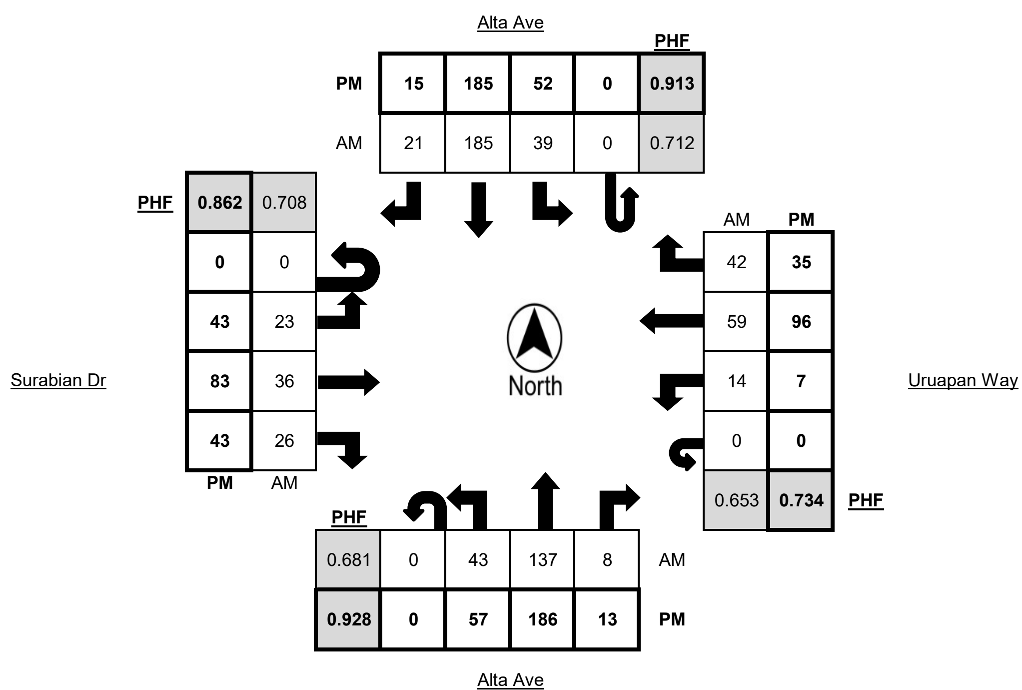
LOCATION	Alta Ave @ Surabian Dr	**LATITUDE**	36.5413
COUNTY	Tulare	**LONGITUDE**	-119.3951
COLLECTION DATE	Wednesday, May 29, 2024	**WEATHER**	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
6:00 AM - 6:15 AM	1	4	10	0	1	0	5	15	2	2	0	6	5	1	1	0	2	7	2	0
6:15 AM - 6:30 AM	0	4	15	1	1	0	4	15	3	1	0	6	0	4	0	0	1	8	4	1
6:30 AM - 6:45 AM	0	7	16	0	2	0	4	31	1	1	0	5	5	1	0	0	1	6	6	1
6:45 AM - 7:00 AM	0	10	14	2	0	0	9	30	3	1	0	7	4	5	2	0	2	10	9	0
7:00 AM - 7:15 AM	0	9	19	1	2	0	7	35	3	1	0	6	8	5	0	0	1	10	7	3
7:15 AM - 7:30 AM	0	3	20	1	0	0	5	38	3	0	0	4	6	7	0	0	3	12	8	0
7:30 AM - 7:45 AM	0	10	52	4	0	0	15	49	4	1	0	7	8	4	1	0	2	13	15	1
7:45 AM - 8:00 AM	0	21	46	2	0	0	12	63	11	4	0	6	14	10	0	0	8	24	12	1
TOTAL	**1**	**68**	**192**	**11**	**6**	**0**	**61**	**276**	**30**	**11**	**0**	**47**	**50**	**37**	**4**	**0**	**20**	**90**	**63**	**7**

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	18	46	3	1	0	13	44	2	1	0	7	26	9	3	0	3	19	12	2
4:15 PM - 4:30 PM	0	11	34	4	1	0	7	45	6	2	0	6	20	11	0	0	1	20	14	0
4:30 PM - 4:45 PM	0	14	46	5	0	0	12	54	3	0	0	14	28	7	0	0	2	16	12	2
4:45 PM - 5:00 PM	0	13	54	2	1	0	14	48	2	1	0	17	18	12	0	0	1	27	6	0
5:00 PM - 5:15 PM	0	15	40	3	1	0	16	43	4	0	0	8	18	9	0	0	4	30	13	2
5:15 PM - 5:30 PM	0	15	46	3	0	0	10	40	6	0	0	4	19	15	1	0	0	23	4	0
5:30 PM - 5:45 PM	0	10	54	5	0	0	13	35	6	0	0	4	22	6	1	0	1	23	10	1
5:45 PM - 6:00 PM	0	16	34	3	0	0	19	42	8	0	0	7	13	10	0	0	1	25	6	1
TOTAL	**0**	**112**	**354**	**28**	**4**	**0**	**104**	**351**	**37**	**4**	**0**	**67**	**164**	**79**	**5**	**0**	**13**	**183**	**77**	**8**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	0	43	137	8	2	0	39	185	21	6	0	23	36	26	1	0	14	59	42	5
4:30 PM - 5:30 PM	0	57	186	13	2	0	52	185	15	1	0	43	83	43	1	0	7	96	35	4

	PHF	Trucks
AM	0.691	2.2%
PM	0.952	1.0%



2020
Quality/ Level of Service Handbook

FDOT

June 2020

State of Florida
Department of Transportation
Systems Implementation Office
605 Suwannee St. MS 19
Tallahassee, FL 32399

www.fdot.gov/planning

Table of Contents

List of Figures

List of Tables

1 Executive Summary

This Quality Level of Service (Q/LOS) Handbook is intended to be used by engineers, planners, and decision-makers in the development and review of roadway capacity and roadway users' Q/LOS at generalized planning levels. This Q/LOS Handbook provides tools to quantify multimodal transportation service inside the roadway environment (essentially inside the right of way).

This edition of the Q/LOS Handbook is updated and reorganized, still providing a foundation for high-quality, consistent capacity, and level of service (LOS) analyses and review in the State of Florida. It includes new analytical techniques from the Transportation Research Board's Highway Capacity Manual (HCM), Sixth Edition, and updated Generalized Service Volume Tables. With these professionally accepted techniques, analysts can easily evaluate roadways from a multimodal perspective, which results in better multimodal decisions for projects in generalized planning phases.

The focus of generalized planning is the extensive use of default values and is intended for broad applications such as regional analyses, initial problem identification, and future year analyses. Florida's Generalized Service Volume Tables at the end of this Q/LOS Handbook are the primary tools for conducting this type of planning analysis. At this time, only Freeways and Uninterrupted Flow Highways Generalized Service Volume Tables have been updated to be consistent with the HCM methodology. The State Signalized Arterials Generalized Service Volume Tables remained the same as the 2013 Q/LOS Handbook. There are future plans to update the State Signalized Arterials Generalized Service Volume Tables to be consistent with the HCM methodology.

Florida Department of Transportation (FDOT) welcomes questions and comments on the content and concepts of this Q/LOS Handbook. FDOT will provide technical assistance and training as needed for usage of the Q/LOS process. For additional resources, see the FDOT's Systems Implementation Office (SIO) website at https://www.fdot.gov/planning/systems/. **Initial contacts should be made with FDOT District and Florida's Turnpike Enterprise personnel**.

2 Q/LOS Handbook Purpose and Scope

This Q/LOS Handbook is a tool that can be utilized to analyze and review a roadway's capacity at a generalized planning level.

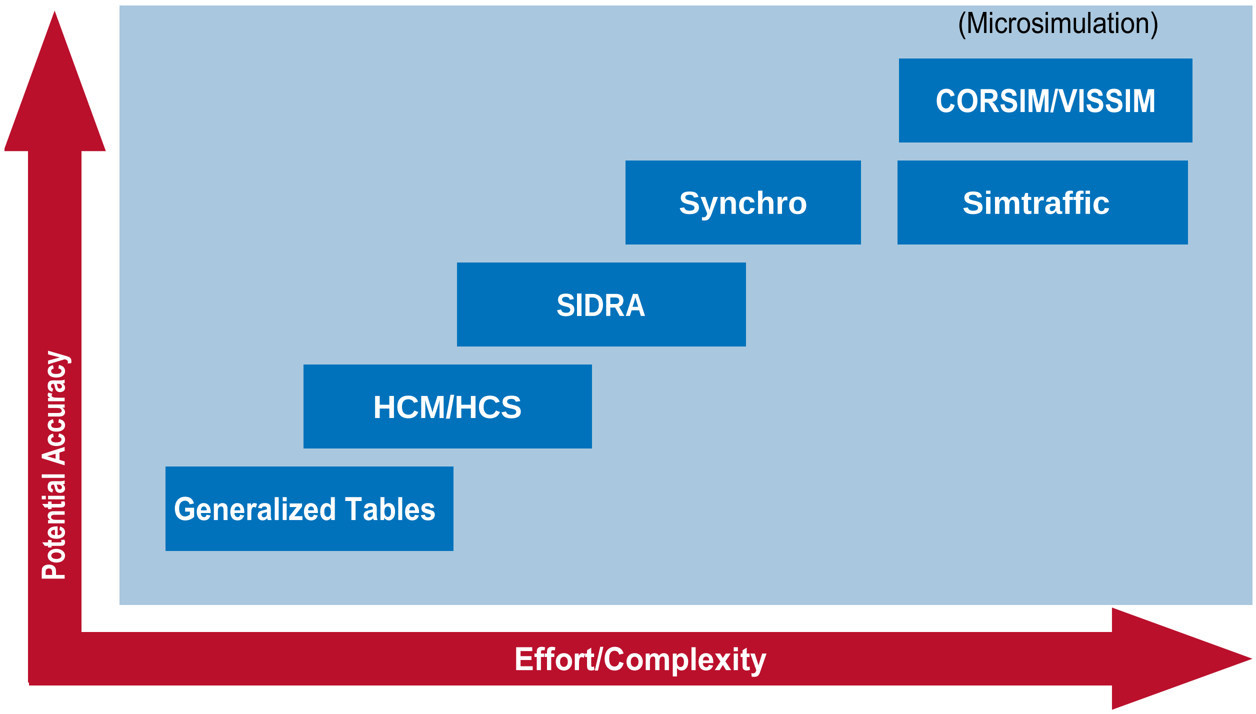
The quality of service (QOS) is a traveler-based perception of how well a transportation service or facility operates. The LOS is a quantitative stratification of the QOS into six letter grades. The LOS provides a measure that assesses multimodal service inside the roadway environment (essentially inside the right of way). **Capacity conceptually relates to the maximum number of vehicles that can pass a point on a roadway in a given amount of time under normal conditions.** The Q/LOS Handbook provides Generalized Service Volume Tables and background regarding statewide default values used in their development. The Generalized Service Volume Tables, found at the end of the Q/LOS Handbook, present maximum service volumes, or the highest numbers of vehicles for a given LOS.

Directions found within the Q/LOS Handbook provide assistance in selecting the most appropriate tools for Q/LOS analysis. This handbook offers specific instructions on how to use the Generalized Service Volume Tables.

2.1. Levels of Analysis

There are many methods for computing capacity and the LOS, which form a hierarchy ranging from Generalized Service Volume Tables (the simplest to use but potentially least accurate) to complex operational analysis tools (very precise, but time-intensive and costly). **Figure 2-1** provides a list of some traffic analysis tools measured by accuracy and complexity. In selecting the appropriate tools, tradeoffs among study purposes (e.g., generalized planning application, signal timing application), accuracy and precision of results (e.g., variability in data for current year analyses, variability in future year analyses), and data preparation effort (e.g., use of existing statewide traffic data, use of direct field measurements) should be considered. Please refer to the FDOT Traffic Analysis Handbook for additional tools and guidance in selecting the appropriate analysis tool.

Figure 2-1: Traffic Analysis Tools



2.1.1. Generalized Planning

Generalized planning covered in this handbook makes extensive use of default values and is intended for broad applications, such as initial problem identification (e.g., deficiency and needs analyses, geographic influence areas), statewide analyses (e.g., statewide calculation of delay), and future year analyses (e.g., 10-year planning horizon).

Florida's Generalized Service Volume Tables provided at the end of this handbook are the primary tools for conducting Generalized planning analysis. The updated tables have been developed using guidance provided in the HCM.

2.2 Travel Modes

The HCM defines four major travel modes: automobile, pedestrian, bicycle, and transit. Each mode includes a unique set of characteristics that define a traveler's experience during a trip, and it is important to consider each perspective when analyzing a multimodal facility.

2.2.1 Automobile

The three major elements that affect the operation of a vehicle are: roadway characteristics, traffic characteristics, and control characteristics.

Vehicles include passenger cars, trucks, vans, buses, recreational vehicles, and motorcycles. Each vehicle type has a unique set of operational characteristics, and the percentage makeup of each vehicle type within a traffic stream affects the capacity of a facility because of these differences. For example, trucks, buses, and recreational vehicles have lower acceleration and deceleration rates than standard passenger cars. Factors, such as pavement type and condition, time of day, and weather, affect the operational characteristics of vehicles as well as driver behavior. Other factors, such as fatigue, health, and driving under the influence of drugs and alcohol, also affect driver behavior. **This handbook assumes base conditions that include typical drivers on dry pavement during daylight hours**.

2.2.2 Pedestrian

Many trips include at least one part where the traveler is a pedestrian. This is particularly important for transit trips, where the pedestrian section of the trip may have an impact on future mode choice.

Analyzing the pedestrian experience can be summarized by two primary types of analysis: individual delay and facility attributes. Delay at intersections can be easily quantified and analyzed. The factors that describe a facility and, therefore, contribute to the overall walking experience are less easily quantified, including safety, security, lighting, grades, surface conditions, and even street activity levels. Automobile and heavy vehicle traffic volume, and the extent to which pedestrians are separated from vehicular traffic, also influence pedestrians' perception of QOS while using a sidewalk. **This handbook accounts for the user's perception and facility attributes when determining Pedestrian LOS (PLOS).**

2.2.3 Bicycle

Bicycles are used to make a variety of trips, including trips for recreation, commuting, and errands. Bicycles can help extend the market area of transit service as bicycle travel is typically five times faster than travel on foot.

Similar to the pedestrian experience, Bicycle LOS (BLOS) can be summarized by delays encountered at intersections as well as the attributes of the facility itself. As with the pedestrian analysis, the Q/LOS Handbook focuses on facility attributes when determining BLOS. These attributes include the volume and speed of adjacent vehicles, heavy vehicle presence, the presence of on-street parking and pavement conditions. Because of the severe deterioration of perceived QOS at flow levels well below the theoretical capacity of a bike path, the concept of capacity has little utility in the design and analysis of bicycle paths.

2.2.4 Transit

Transit riders can be grouped into two primary categories: choice and captive riders. Choice transit riders typically have other means of transportation readily available, but choose transit to avoid congestion, save money on fuel and parking, use their travel time productively for other activities, and/or reduce their impact on the environment. Captive riders, however, are unable to drive because of age, physical, mental, or financial reasons, and depend on transit or other modes for their daily transportation needs.

Unlike other modes, transit is primarily focused on service levels rather than facility characteristics. Infrastructure for driving, biking, or walking is available at all times, once constructed; transit service is only available during certain times along designated routes. Additionally, transit passengers are not in direct control of their travel time, service frequency and reliability, therefore, these are important factors that affect the quality and utility of transit service.

When bus service frequencies reach a high enough level of demand (headway of approximately 10 minutes or less), bus passengers do not feel the need to consult bus schedules. This allows transit users the freedom to treat the system as they would treat other modes. Service frequencies that require passengers to plan their trips around a limited transit schedule offer much less utility, and deter choice riders.

Because transit passengers typically must walk to and from transit stops on either end of their trip, the quality of the walking experience at the beginning or end of a trip may be just as important to the transit passenger as the actual transit experience.

2.3 What's New in This Version of the Q/LOS Handbook?

This edition of the Q/LOS Handbook primarily reflects an update to the 2013 edition and incorporates updates included in the sixth edition of the HCM. The Q/LOS Handbook has been revised to focus on generalized planning for freeways and highways. No changes have been made in this version of the handbook to the arterial methodology and arterial Generalized Service Volume Tables from the 2013 Q/LOS Handbook.

The Generalized Service Volume Tables are the primary tools supported by FDOT for generalized planning. The freeway and highway automobile mode portions of the tables have been updated using the Highway Capacity Software 7 (HCS7), which incorporates the latest procedures provided in the HCM, Sixth Edition. The updated tables also include revised inputs and parameters that coincide with the current methodology in the HCM and default values. The updated tables can be found at the end of this handbook. A summary of the methodology changes is provided below:

- The Generalized Service Volume Tables
    - The 2020 freeway and highway Generalized Service Volume Tables were developed using HCS7, which is based on the HCM, Sixth Edition.
    - There are **no changes** for arterial service volumes between the 2012 and 2020 Generalized Service Volume Tables.
- The freeway service volumes are now based on freeway facilities procedures, incorporating basic segments and interchanges rather than just basic segments.
- The inputs are generally consistent between the 2012 and 2020 versions of the tables, but there have been some updates to maintain internal consistency in the 2020 set of tables.
- New inputs such as Speed Adjustment Factor (SAF) and Capacity Adjustment Factor (CAF) have been introduced into the development of the tables because the input requirements for HCS7 are more extensive than those for Level of Service Planning (LOSPLAN).
- FDOT **no longer** supports the LOSPLAN program and it has not been included in this version of the handbook.

3 Q/LOS Principles

Providing safety and mobility for people and goods remains transportation's most essential function and part of FDOT's mission. There are four dimensions of mobility:

- Quality of travel: traveler satisfaction with a facility or service.
- Quantity of travel: magnitude of use of a facility or service.
- Accessibility: ease in which travelers can engage in desired activities.
- Capacity utilization: quantity of operations relative to capacity.

This Q/LOS Handbook focuses primarily on quality, followed by capacity utilization. The quantity of travel and accessibility dimensions are not addressed in this Q/LOS Handbook.

The QOS is based on a user's perception of how well a transportation service or facility operates. In other words, it's how travelers perceive the overall QOS.

The LOS is a quantitative stratification of the QOS.The HCM divides highways QOS into six letter grades, A through F, with A being the best and F being the worst. With this scheme, traffic engineers more easily explained operating and proposed design concepts to the general public and elected officials.

Despite its widespread use as an independent measurement, it is important to note that the LOS is simply a quantitative breakdown from transportation users' perspectives of transportation QOS. The LOS reflects the QOS, as measured by a scale of user satisfaction, and is applicable to each of the following modes that use roadways: automobiles, trucks, bicycles, pedestrians, and buses.

Because this handbook deals with the overall quality of user satisfaction and its quantitative breakdown, it is labeled as the Q/LOS Handbook. The measurement techniques, however, are simply referred to as LOS analysis. This Q/LOS Handbook deals with the QOS and the LOS that roadways provide to users (i.e., motorists, bicyclists, pedestrians, and transit passengers) and provides planning tools to assist transportation planners and engineers. The overall quality of the entire trip experience, which depends on a variety of factors, including aesthetics, safety, and other social measures are not covered in this handbook.

3.1 Common Q/LOS Misconceptions

Common misconceptions about Q/LOS that often arise:

- The QOS is directly related to all other dimensions of mobility.

This misconception is related to the relationship between quality and other dimensions of mobility. *The QOS is frequently related to the other dimensions of mobility, but not in all cases.* Q/LOS for automobile drivers is usually closely linked to how many other vehicles are on the road. However, the relationship is not always perfect.

For example, arterial speeds are more closely tied to signalization conditions than the number of other vehicles on the roadway. A higher Q/LOS grade may exist on a four-lane arterial with twice the volume of another arterial due to efficient signal progression. For transit users, pedestrians, and bicyclists, there is often an even weaker relationship between total demand and Q/LOS. **In most situations in Florida, the total number of bicyclists and pedestrians on a facility has very little, if any, impact on Q/LOS.Similarly, in most of Florida, bus**

frequency is typically much more important to transit users than how many people are actually on a bus.

In some cases, particularly for the non-automobile modes, an analysis of total potential demand is a more important component of the decision-making process than the QOS. This handbook only addresses Q/LOS, not the methods of determining overall demand or mode splits. Other tools, such as logit models, are more appropriate for these types of analyses.

- The LOS is applicable only to automobile analysis, while the QOS is related to the non-automobile modes.

This misconception is that LOS applies only to automobiles, and QOS applies to the non-automobile modes. It is often assumed that while automobile analyses are highly quantitative, the bicycle, pedestrian, and transit analyses are more qualitative. *However, the bicycle, pedestrian, and transit techniques are as quantitative and rigorously developed and tested as those for automobiles.* An example of LOS by mode for arterials is illustrated in **Figure 3-1**.

Figure 3-1: Examples of LOS by Mode for Arterials

- The LOS A–F grades are comparable to American school letter grades.

The most common misconception about LOS A–F grades is that they are comparable to school letter grades. Although they share some basic similarities, there are some important distinctions to make at a planning level. *Unlike school grades, LOS A is not necessarily a desirable goal, and the meaning of A–F is not entirely consistent across modes.* **Although it is true that LOS A is best and LOS F is worst, this is strictly from a traveler experience and perspective. LOS A is not necessarily a desirable goal to achieve from an overall transportation or societal perspective.** LOS A in a peak travel hour could be an indicator of an inefficient use of limited funding. It is simply not cost-effective to design the state's roadways to operate at LOS A during the peak hour. FDOT's LOS targets in **Chapter 10** should be considered a desirable condition during the peak hour, with significant variance from those targets in either direction an undesirable condition. The LOS targets are an FDOT Policy (000-525-006) and discussed in **Chapter 10**.

Although LOS F represents a failing condition, there are more factors to consider when the LOS reaches F. Essentially, LOS F either means travel demand exceeds capacity and the roadway is operating in oversaturated conditions, or another undesirable condition exists.

Although each of the methodologies for automobiles, bicycles, pedestrians, and buses make use of the LOS A–F scales, **the meaning of A–F is not entirely consistent across the modes.**

Transportation professionals widely consider LOS D for the automobile mode an acceptable condition, and this threshold is often used as a design condition in urbanized areas. The bus and automobile LOS scales were developed by transportation professionals, with the objective of classifying various levels of congestion in undersaturated conditions. Members of the general public, however, determined the derivation of the bicycle and PLOS thresholds, thus incorporating a general perception of LOS D as a largely undesirable condition. Because of this, LOS D likely represents a worse condition from the user perspective for the bicycle and pedestrian modes than the automobile and bus modes. FDOT and its research team evaluated and considered various methods to make the LOS thresholds more consistent across modes, but found no scientific basis to adjust the scales. Users should therefore simply be cautious about comparing the same LOS letter grade across modes.

3.2. Highway Capacity Manual

For capacity and automobile, pedestrian, and bicycle Q/LOS analysis, the HCM is the foremost recognized and accepted analysis tool. HCM defines capacity as the maximum sustainable flow rate, which persons or vehicles can reasonably be expected to traverse a point or a uniform segment of a lane or a roadway during a given time period under prevailing roadway, environmental, traffic, and control conditions.

3.2.1 Traffic Flow and Capacity Concepts

The HCM defines two primary facility types: uninterrupted and interrupted flow facilities. The terms refer to the type of facility and, therefore, the analysis type, not the quality of traffic flow at any given time.

Uninterrupted flow facilities have no fixed causes of delay or interruption external to the traffic stream, such as signals or stop signs. Non-tolled freeways represent the purest form of uninterrupted flow, because there are no fixed interruptions to traffic flow, and access to the facilities are limited to ramp locations. Multilane and two-lane highways operate under uninterrupted flow in long segments between points of fixed interruption (e.g., traffic signals), but it is often necessary to examine the points of fixed interruption using interrupted flow methodologies.

Interrupted flow facilities have fixed causes of periodic delay or interruption to the traffic stream, such as traffic signals or stop signs, with average spacing less than or equal to 2 miles. Traffic flow patterns on interrupted flow facilities are the result not only of vehicle interactions and the facility's geometric characteristics, but also of the traffic control used at intersections and the frequency of access points to the facility. Traffic signals, for example, allow designated movements to occur only during portions of the signal cycle, and therefore affect flow and capacity, because the facility is not available for continuous use. Traffic signals also create platoons of vehicles that travel along the facility as a group. By contrast, intersections controlled by all-way stops and roundabouts discharge vehicles more randomly, creating periodic but sometimes small gaps in traffic at downstream locations.

Capacity on uninterrupted and interrupted flow facilities can be defined in terms of, passenger cars per hour (pcph), or vehicles per hour (vph), depending on the type of analysis or system element.

Reasonable expectancy is the basis for defining capacity. Capacity is, therefore, not the absolute maximum flow rate observed at a facility, but rather a flow rate that can be achieved repeatedly for peak periods of sufficient demand.

Prevailing roadway, traffic, and control conditions define capacity. These conditions should be relatively uniform for any segment of a facility that is analyzed. Base conditions, by comparison, assume optimum conditions, including good weather, dry pavement conditions, users who are familiar with the system, and no impediments to traffic flow. In most cases, prevailing conditions differ from base conditions (e.g., there are trucks in the traffic stream, rolling terrain). As a result, the computations of capacity, service flow rate, and LOS include an adjustment to capacity under base conditions.

3.2.2. Bicycle LOS (BLOS)

BLOS is based on bicyclists' perceptions of the roadway environment. BLOS is based on five variables, with relative importance ordered in the following list:

- Average effective width of the outside through lane
- Vehicle volumes
- Vehicle speeds
- Heavy vehicle (truck) volumes
- Pavement condition

Average effective width is largely determined by the width of the outside travel lane and striping for bicyclists but includes other factors, such as the effects of street parking and drainage grates. Each of the variables is weighted by coefficients derived by stepwise regression modeling importance. A numerical LOS score, generally ranging from 0.5 to 6.5, is determined and stratified to an LOS letter grade. Thus, unlike the determination of automobile LOS, in which there is typically only one service measure (e.g., average travel speed), BLOS is determined by multiple factors.

3.2.3. Pedestrian LOS (PLOS)

Like BLOS, **PLOS is based on the pedestrians' perceptions of the roadway or nearby roadside environment.** PLOS is based on four variables with relative importance ordered in the following list:

- Existence of a sidewalk
- Lateral separation of pedestrians from vehicles
- Vehicle volumes
- Vehicle speeds

The PLOS model applies to the roadway facilities within the right of way. Therefore, estimating PLOS for facilities outside the right of way at significantly greater distance, may exceed the validated range of the model and is not recommended.

3.3. Transit Capacity and QOS

The Transportation Research Board (TRB) Transit Capacity and Quality of Service Manual (TCQSM) is the nation's leading document for transit and Q/LOS analysis. As used in this Q/LOS Handbook, transit or bus is limited to scheduled, fixed-route bus transit.

One significant exhibit in the TCQSM is a table for urban scheduled transit service based on service frequency. **Table 3-1** replicates this TCQSM table, but includes Florida-specific modifications to the adjusted service frequency.

Table 3-1: Service Frequency LOS Thresholds

Level of Service	Adjusted Service Frequency (Vehicles/hour)	Headway (minutes)	Comments
A	>6	<10	Passengers don't need schedules
B	>4	<15	Frequent service, passengers consult schedules
C	≥3	≤20	Maximum desirable time to wait if transit vehicle missed
D	≥2	≤30	Service unattractive to choice riders
E	≥1	≤60	Service available during hour
F	<1	>60	Service unattractive to all riders

3.4. Simplifying Assumptions

Planning-level analyses make extensive use of default values and simplifying assumptions to the operational models on which they are based. As such, there are multiple simplifying assumptions used in this Q/LOS Handbook.

3.4.1. Averages

This Q/LOS Handbook makes extensive use of averages. **For generalized planning (Generalized Service Volume Tables), most of the default input variables represent statewide averages. Similarly, for generalized planning, simple averages are recommended.** For example, if an arterial facility has daily volumes of 20,000, 25,000, and 24,000, it would be reasonable to use the average (23,000) of the three. However, users should be cautious of outlying values and use some judgment when applying simple averages. In the above example, if the first value were 10,000, the user may want to disregard that value or use the median value (i.e., 24,000).

3.4.2. Turning Movements

One of the most significant planning assumptions is that the mainline turning movements are adequately accommodated. Within this Q/LOS Handbook, the through movement is defined as the traffic stream with the greatest number of vehicles passing directly through a point. While this movement is typically the Straight Ahead movement, occasionally the right or left turn could qualify as the through movement. When the turning movement has the greatest number of vehicles (more than the Straight Ahead), it is recommended to consider the turning movement as the controlling movement. See **Section 5.9** for additional details.

Most analyses of through movements in the HCM are relatively straightforward. Complications arise with the treatment of turning or merging movements, especially for signalized intersections and arterials. By handling turning arterial movements (i.e., turns from the arterial, side-street movements) in a general way, Q/LOS and capacity analyses are greatly simplified. This is also true for some two-lane uninterrupted flow highways in which mid-block turning movements may affect capacity. Off- and on-ramp movements along freeways are also handled in a general way and are assumed to be adequately accommodated. Most importantly, it is assumed that movements at off-ramps do not back up into the through lanes of the freeway.

When turning movements are not adequately accommodated in the available storage, the techniques to determine the LOS for an arterial found in this handbook are not appropriate. Although, the arterial analysis in this handbook includes all vehicles on the arterial, the focus is on the vehicles making through movements rather than turning movements. For example, only the green time for the through movement is included, and penalties are assigned if there are no left-turn lanes at signalized intersections and no medians exist mid-block.

3.4.3. Queue Spillback

Another major assumption is that turning movements do not back up into adjacent through lanes. Essentially, adequate storage is assumed to be available for turning vehicles on arterials and for vehicles exiting freeways. Therefore, where mainline turning movements are not adequately accommodated, the planning techniques found in the Q/LOS Handbook are not appropriate. If this is the case, higher level analysis is recommended.

3.4.4. Capacity

For the HCM analyses of uninterrupted flow facilities, capacity is set in terms of passenger cars per hour per lane (pcphpl). **Free-flow speed is estimated based on other variables, such as percent heavy vehicles, CAFs and SAFs, median type, and lateral clearance.**

For the HCM analyses of interrupted flow facilities, capacity represents the maximum number of vehicles that can pass a point during a specified time period under prevailing roadway, traffic, and control conditions.

The Q/LOS Handbook primarily relies on and reports capacity values based on the interrupted flow concept of capacity, with free-flow speed considered a roadway variable input. **For planning purposes, the assumed free-flow speed is 5 mph over the posted speed limit.**

3.4.5. Bus Frequency

For transit analysis purposes, the most significant assumption is that bus frequency is the single most important factor in determining the Q/LOS to transit users along a transit route segment or roadway facility. FDOT, in cooperation with the TCQSM authors and others, has incorporated that concept. Certainly, the LOS varies for individual transit users along a facility, but **in the determination of bus LOS along a transit route segment or roadway facility, the availability of buses is usually the more relevant performance measure.**

3.5. Arterial Analyses

ADJUSTED SATURATION FLOW RATE

Variables such as area type, speed limit, number of lanes, percent right turn lanes, percent heavy vehicles, median type, left turn lanes and population size have effects on adjusted saturation flow rates. Furthermore, as traffic queues get longer, traffic pressure affects capacity.These effects are included in FDOT’s Generalized Service Volume Tables.

ADD-ON/DROP-OFF LANES

The add-on/drop-off lane (or expanded intersection) will contribute to intersection capacity, but not likely to the extent of a full through lane. The add-on/drop-off lane contains up to half the capacity of a full through lane. For any capacity benefit to be considered, two conditions should be met:

- the add lane and drop lane each must be at least 800 feet in length
- the add-on/drop-off pair combined must be at least 1,760 feet in length

For additional discussion, see **Section 4.3.1**.

ONE-WAY STREETS

The Generalized Service Volume Tables include a factor that has been approved for the evaluation of one-way streets. Essentially, one-way pairs are assumed to have a 20 percent higher service volumes than corresponding two-way roadways with the same number of lanes.

LOS CRITERIA

The maximum control delay at a signalized intersection for LOS D is 55 seconds. While that value may be reasonable based on user perception in an urbanized area, in a small town or at an isolated intersection on a rural highway, that delay would be considered LOS F. To overcome this difference in user perception, FDOT has adopted different control delay criteria in rural undeveloped and rural developed areas. The criteria are one-half, rounded up, of the urbanized area criteria. For arterials in rural developed areas, arterial Class I LOS thresholds apply. These LOS criteria are embedded in FDOT's rural undeveloped and rural developed Generalized Service Volume Tables. The LOS criteria appear on the back of each table.

3.5.1 Pedestrian and Bus Analyses

PEDESTRIAN LOS

PLOS is determined by the methodology contained in this handbook. **The methodology is consistent and unchanged from the 2013 Q/LOS Handbook.** The pedestrian LOS adjustment factors as they relate to bus LOS are shown in **Table 3-2**.

Table 3-2: PLOS Adjustment Factors on Bus LOS

Pedestrian Level of Service	Adjustment Factor
Pedestrian LOS A	1.15
Pedestrian LOS B	1.10
Pedestrian LOS C	1.05
Pedestrian LOS D	1.00
Pedestrian LOS E	0.80
Pedestrian LOS F	0.55

ROADWAY CROSSING DIFFICULTY

When catching a bus, transit users frequently have to cross a road. **Crossing difficulty is typically influenced by three broad factors: traffic signal density, crossing length, and vehicle volume.** It is more difficult to cross roadways with low signal densities than roadways with closely spaced, signalized intersections. Mid-block crossing difficulty increases with road width and lack of pedestrian refuges (i.e. restrictive or raised medians). Mid-block crossing difficulty also increases as the number of vehicles increase, which results in fewer gaps. These three broad factors and other major factors, such as vehicle speed, are interrelated. To account for crossing difficulty in a general way, FDOT's approach includes a set of roadway crossing adjustment factors which capture the crossing difficulty. **Roadway crossing adjustment factors are used to determine the adjusted bus frequency by applying a factor that captures crossing difficulty.**

PASSENGER LOAD FACTOR

Bus crowding plays a role in the user's perception of QOS, particularly on overcrowded buses when no seating is available. FDOT's approach includes a set of passenger load factors, which are applied to help determine the adjusted bus frequency value. **Passenger load factors are used to determine the adjusted bus frequency value by applying a factor commensurate to the level of passenger crowding.** These factors can be found in **Chapter 7** of this Q/LOS Handbook.

BUS STOP AMENITIES

Passenger comfort and safety within the passenger waiting areas play a role in user perception of the QOS and desirability of a transit system. FDOT's approach includes a set of bus stop amenity factors, which are used to help determine the adjusted bus frequency value. The factors can also be found in **Chapter 7** of this Q/LOS Handbook.

BUS STOP TYPE

Delay time at bus stops plays a role in travel times along routes, and thus impacts overall average travel speed. **FDOT includes a bus stop type adjustment factor, which is used to add 15 to 35 seconds of delay per route for typical and major bus stops, respectively.**

BUS FACILITY ANALYSIS

The TCQSM structure for Q/LOS analysis consists of points (e.g., bus stops), route segments, and systems. It does not include a facility analysis. Nevertheless, to maintain consistency, a method of aggregating segment-level bus frequency to facility-level was needed. At the generalized level, a simple average is acceptable. For example, if on a 3-mile facility, four buses serve the first 2 miles and two buses serve the last mile, then using a value of three buses [(4 + 2)/2] is acceptable for a generalized level analysis.

4 Roadway Variables

Florida's Generalized Service Volume Tables are based on the HCM, TCQSM, and Florida roadway, traffic, control (signalization), and multimodal data. **The resulting tables are valid in Florida, and FDOT encourages the use of the generalized planning level approach.** Recognizing varying characteristics with the state and differing roadway, traffic, control, and multimodal characteristics, the Generalized Service Volume Tables are not adequate for all analysis needs. **Chapters 4 through 7** provide a description of input variables used in the development of the Generalized Service Volume Tables. Roadway variables describe the geometric and functional characteristics of a facility.

4.1. Roadway Type

Compatible with the terminology of the HCM, this Q/LOS Handbook is based on three major roadway types:

- Freeways
- Uninterrupted flow highways
- Interrupted flow roadways

Note: when using the Generalized Service Volume Tables, the number of lanes for arterials and other interrupted flow facilities should be determined at major intersections, rather than mid-block.

4.1.1. Freeways

Freeways are multilane, divided highways with at least two lanes for exclusive use of traffic in each direction and full control of ingress and egress.

4.1.2. Highways

Uninterrupted flow highways are roadways with a combination of roadway segments, which have average signalized intersection spacing greater than 2 miles and are not freeways. Because of the significantly different operating characteristics, these types of roadways are frequently also distinguished as two-lane highways and multilane highways.

4.1.3. Arterials

Interrupted flow roadways or arterials are characterized by signals with average signalized intersection spacing less than or equal to 2 miles. In this Q/LOS Handbook, signalized arterials are the predominant type of interrupted flow roadway. They primarily are operated by the state and serve through traffic. Also included in this category are signalized Non-State roadways, but not local streets. As used here, signalized intersections refer to all fixed causes of interruption to the traffic stream and may occasionally include stop signs or other control types.

Arterials are further classified based on posted speed. There are two arterial classes:

- Class I: Arterials with a posted speed of 40 mph or greater
- Class II: Arterials with a posted speed of 35 mph or less

4.2. Area Type

Four broad area type groupings are used in this Q/LOS Handbook, as shown in **Figure 4-1**:

- Core Urbanized areas (areas with a population of 1,000,000+) and Urbanized areas (other urbanized areas with a population of 50,000+)
- Transitioning areas (transitioning into urbanized areas)
- Urban areas (areas with a population of more than 5,000 not in urbanized areas)
- Rural areas (rural undeveloped areas or developed areas with less than 5,000 population)

Figure 4-1: Area Types

The area types in the Generalized Service Volume Tables correspond well with FDOT's LOS targets; however, there are a few special cases**. FDOT District LOS Coordinators should be consulted for applicable boundaries within their districts.**

There may be small lengths of roadways (e.g., approximately 6 miles for freeways, 3 miles for nonfreeways) between area types or adjacent to an area type that, from a logical and analytical sense, should be combined into one area type or another.

These situations typically occur with adjacent interchanges or in transitioning areas, but may also occur elsewhere. FDOT districts have the flexibility to adjust the area type boundaries or designate a roadway with a certain area type under these circumstances.

As Florida's population grows, area types may change for a specific location or roadway in future years. FDOT's district offices (contact information available at http://www.fdot.gov/info/moreDOT/districts/district.shtm) should be consulted if analysts believe different area types are appropriate for a future study period.

4.2.1. Core Urbanized and Urbanized Areas

Core urbanized and urbanized areas are defined as approved boundary, which encompasses the entire Census Urbanized Area, as well as the surrounding geographic area likely to become urbanized within the next 20 years, as agreed on by FDOT, Federal Highway Administration (FHWA), and the Metropolitan/Transportation Planning Organization (MPO/TPO). **Core urbanized area types are distinguished by whether the area's population is more or less than 1 million.** Currently, the grouping of more than 1 million applies to the MPO areas that include central cities: Fort Lauderdale, Jacksonville, Miami, Orlando, St. Petersburg, Tampa, and West Palm Beach. These are referred to as "core urbanized." **The minimum population for an urbanized area is 50,000.**

Previously, core urbanized thresholds were developed by applying a different K factor to the urbanized design hourly volume (DHV) thresholds, but after careful consideration, it was noted that additional factors could be applied in the analysis process for a core urbanized area, such as speed and ramp density, and these should be considered. As a result, new DHV, directional design hourly volume (DDHV), and annual average daily traffic (AADT) thresholds were developed for core urbanized areas based on separate analysis from the urbanized thresholds. **The urbanized areas with less than 1 million population are referred to as "other urbanized."**

4.2.2. Transitioning Areas

Transitioning areas are fringe areas that exhibit characteristics between rural and urbanized/urban. Transitioning areas are intended to include areas that, based on their growth characteristics, are anticipated to become urbanized or urban in the next 20 years.

Frequently, the Metropolitan Planning Area is used for the transitioning area adjacent to an FHWA Urbanized Area (Adjusted Census Urbanized Area Boundary). The definition of Metropolitan Planning Area mentions the "contiguous area expected to become urbanized with the 20-year forecast period." It is the contiguous area that should be considered the transitioning area. However, in practice, most MPOs have not delineated those contiguous or transitioning areas, and many of the Metropolitan Planning Areas extend to remote rural areas of counties. When the MPO does not identify these transitioning areas, or areas adjacent to urban (but not urbanized) areas, FDOT districts, in cooperation with local governments, may delineate transitioning areas for LOS purposes.

Keeping the boundaries relatively consistent over time is desirable to achieve understanding by all potential parties. The transitioning boundary should be reviewed and adjusted as a part of the census cycle update, consistent with the setting of the FHWA Urbanized Area boundaries. It is appropriate to review the transitioning boundary in conjunction with a Long-Range Transportation Plan update. The FDOT District LOS Coordinators should be consulted for transitioning boundaries within their districts. It is recommended that boundaries for transitioning areas be based on the location of major roadways or at interchanges. This avoids portions of a freeway changing from transitioning to urbanized or rural between interchanges. It is desirable for an urban street to have the same designation between major roadways and not change mid-block when aligning the boundary with major roads is impractical.

4.2.3. Urban Areas

An urban area has a population between 5,000 and 50,000 and is not within an urbanized area. The boundaries for cities with populations over 5,000 and not within urbanized areas are primarily set by existing city limits and must be agreed upon by FDOT, the local government, and FHWA. However, the 5,000 population threshold is primarily a surrogate for areas that exhibit urban traffic characteristics. When a city has a population of less than 5,000 but the surrounding area has a population of more than 5,000 and the city has an urban character, then it is reasonable to classify it with a population of more than 5,000 in the Generalized Service Volume corresponding to a population of over 5,000. These are Generalized Service Threshold Volume Tables 2, 5 and 8 at the end of this handbook following the Glossary.

Other situations exist in which an area has a population of over 5,000 and yet, the area is more characteristic of a rural developed area. In this situation, it is reasonable to use the “developed areas less than 5,000 population” sections of Generalized Service Threshold Volume Tables 3, 6, and 9 included at the end of this handbook following the Glossary. In both of these situations, FDOT District Planning Offices, after consultation with the Central Office Systems Implementation Office, should determine the appropriate designation to use.

4.2.4. Rural Areas

Rural areas consist of two types:

- Rural undeveloped: areas in which there is no or minimal population or development
- Rural developed: areas consisting of cities and other populated areas with populations of less than 5,000 or along coastal roadways

Generally, the portion for cities or developed areas in Generalized Service Threshold Volume Tables 3, 6, and 9 should be applied to areas with a population between 500 and 5,000 and not immediately adjacent to urbanized, urban, or transitioning areas. This portion of the tables also should be generally applied to coastal roads not in urbanized, urban, or transitioning areas.

4.3. Number of Through Lanes

The number of through lanes is one of the most important variables to analyze a roadway’s capacity and LOS. Emphasis is placed on through lanes, or lanes that directly accommodate through traffic. The number includes shared lanes (e.g., through/right), but does not include exclusive turn lanes or two-way left-turn lanes on arterials, auxiliary lanes on freeways, or passing lanes on two-lane highways. Arterials are often described as having an odd number of lanes when two-way left-turn lanes are present. However, for highway capacity and LOS analyses, that is not appropriate. The two-way left-turn lane does not accommodate through vehicles, and the facility is more appropriately characterized as having an even number of lanes with a non-restrictive median.

Usually the total number of through lanes in both directions is used to describe roadways. However, this Q/LOS Handbook bases analyses upon a single peak direction. As an example, an LOS analysis for a six-lane freeway is based on three lanes, using the higher directional traffic volume. Similarly, an LOS analysis for a four-lane urban street would be based on two directional lanes.

A common question when using the Generalized Service Volume Tables is how do we handle odd number lanes along the facility. The Generalized Service Volume Tables contain adjustment factors based on certain characteristics of the facility (i.e., turn lanes, medians, etc.). Any applicable adjustment factors are first applied and then the average service volumes are averaged.

For example, a rural undivided 5-lane arterial facility with exclusive left-turn lanes and without exclusive right-turn lanes will have an adjusted LOS C threshold of 35,388. This is calculated using the Generalized Service Volume Table 3. The LOS C thresholds for an undivided 4 and 6-lane arterial in a rural area is 29,300 and 45,200, respectively. To calculate the 5-lane LOS C threshold, first account for any applicable adjustment factors. For this example, the LOS thresholds must be adjusted by -5% for multilane arterials that have exclusive left-turn lanes and no exclusive right-turn lanes. After this adjustment is applied, the new 4 and 6-lane LOS C thresholds are 27,835 and 42,940, respectively. To obtain the final 5-lane LOS C threshold, the newly adjusted 4 and 6-lane LOS C thresholds, 27,835 and 42,940, are averaged to obtain the 5-lane LOS C threshold of 35,388 to be used in the analysis.

4.3.1. Arterials

An important aspect of this Q/LOS Handbook is the methodology for determining an arterial's number of through lanes. The ultimate result of the LOS analysis is a facility estimation of the LOS, and **it is widely recognized that signalized intersections are the arterial's primary capacity constraint; therefore, it is appropriate to place more emphasis on the intersections' characteristics than the mid-block characteristics.** Generally, mid-block segments have capacities far exceeding those of major intersections, and it is rare for significant delays to occur mid-block. By weighting the effects of intersections more heavily, a more accurate aggregate estimation is possible.

Site-specific characteristics (e.g., intensity and type of land use, driver behavior, speed, etc.) can dramatically affect the viability of add-on/drop-off pairs as through lanes; therefore, each approach should be examined on a case-by-case basis. Analysts are strongly cautioned to review all pertinent characteristics prior to adjusting the number of through lanes used. The reviews should be conducted during peak travel conditions. Analysts are encouraged to consult with their FDOT District LOS Coordinators prior to applying this concept. The following guidelines are offered as a capacity estimating tool only. This process should never be used for the design or redesign of an expanded intersection.

For any capacity estimation to be considered, two conditions should be met:

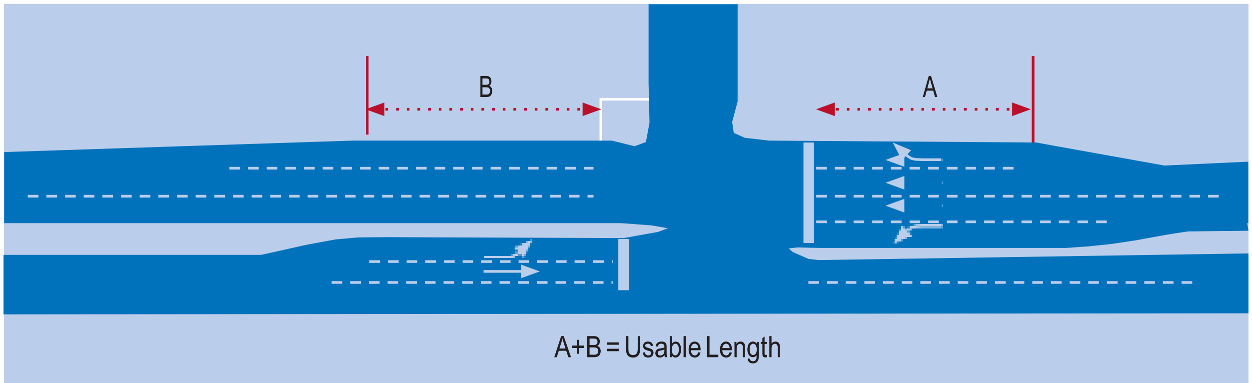
- The add and drop lanes must each be at least 800 feet in length
- The add-on/drop-off pair combined must be at least 1,760 feet in length

If either of these conditions is not met, then no additional capacity is assumed.

If the add-on/drop-off pair is at least one-third of a mile in length (roughly divided equally between approach and departure and exclusive of tapers and cross-street width, as represented by A+B in **Figure 4-2**), it may be reasonable to consider an additional one-half lane for capacity purposes. For example, in the accompanying diagram, if A = 1,000 feet and B = 1,000 feet, then it would be reasonable to consider that the intersection approach has 2.5 effective through lanes.

With a length of at least one-half mile (roughly divided equally between the add and drop lanes), it may be reasonable to consider the add-on/drop-off pair as adding up to one full through lane.

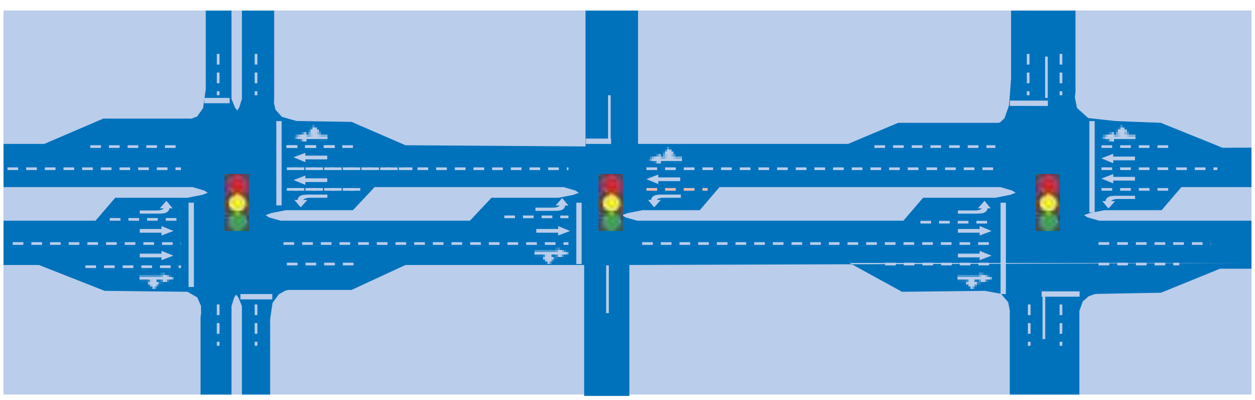
Figure 4-2: Usable Length



When using the Generalized Service Volume Tables, the number of through lanes on a facility is typically determined by the through and shared through/right lanes at major intersections rather than mid-block. Figure 4-3 shows the mid-block segments with four lanes, with two lanes in each direction. The major intersections each have six lanes, with two through and one shared through/right add-on/drop-off lane with tapers adequate for safe merging.

In this illustration, as in many cases, minor signalized intersections have green times so heavily weighted to the major urban street that they do not cause significant delays to through traffic. When this is the case, it is sometimes acceptable to disregard the number of lanes at these minor intersections; instead, the determination should be based on the lanes at major intersections. So in terms of the LOS, this particular facility has six lanes.

Figure 4-3: Example of Six-Lane Roadway



4.3.2. Highways

For uninterrupted flow highway facilities, the number of lanes is the basic segment or mid-block laneage. For example, a two-lane highway, which is widened to four lanes at major intersections, should be considered a two-lane highway.

4.4. Speed

4.4.1. Posted Speed

The maximum speed at which vehicles are legally allowed to travel over a roadway segment.

4.4.2. Free-Flow Speed

Free-flow speed is the average speed of vehicles not operating under the influence of speed reduction conditions. In general, free-flow is the average speed under low-flow conditions and not influenced by control conditions, such as signalized intersections. The assumption used in this handbook is that the free-flow speed is 5 mph above the posted speed. As an example, if an arterial has a posted speed of 40 mph, the default free-flow speed used is 45 mph; however, if a more accurate free-flow speed is available, it should be used.

4.5. Median Type

4.5.1. Arterials

As used in this document, medians may be classified in one of three ways:

- restrictive median (r)
- non-restrictive median (nr)
- no median (n)

A restrictive median is a raised or grassed area normally at least 10 feet in width separating opposing mid-block traffic lanes and includes left-turn lanes.

A non-restrictive median is a painted at-grade area normally at least 10 feet in width separating opposing mid-block traffic lanes, and for arterials, accommodates mid-block left-turning vehicles to exit from through lanes. Continuous two-way left-turn lanes are considered a non-restrictive median under this definition. Situations in which restrictive or non-restrictive medians are less than 10 feet wide are considered as having no median.

FDOT included the median factor to account for lowering mid-block average travel speeds when no median is present. From the aspect of getting left-turning vehicles out of the traffic stream, the difference between a restrictive and a non-restrictive median is relatively inconsequential. Thus, in determining automobile LOS, restrictive and non-restrictive medians are treated the same.

From a pedestrian point of view, there is a significant difference between non-restrictive medians and restrictive medians. Restrictive medians give pedestrians a much safer mid-block crossing. Thus, this type of median is a consideration in determining the pedestrian crossing factor that enters the bus LOS analysis. **A non-restrictive median provides no pedestrian refuge.**

A pedestrian refuge is an area at least 5 feet but less than 10 feet in width (not a full, raised median) separating opposing mid-block traffic lanes and allowing pedestrians to cross the roadway more safely and comfortably. From a pedestrian point of view, a pedestrian refuge has nearly the same benefit as a restrictive median. In terms of pedestrian crossing difficulty, the difference between a restrictive median and pedestrian refuge is relatively small; therefore, in determining pedestrian crossing difficulty, the two may be treated the same.

Pedestrian refuges are not included as a distinct category. If an analyst needs to evaluate the effects of a pedestrian refuge, it should be treated as a restricted median for transit analysis, but as no median for automobile analysis.

4.6. Exclusive Turn Lanes

4.6.1. Arterials

EXCLUSIVE LEFT-TURN LANES

The exclusive left-turn lanes are reserved for the exclusive use of left-turning vehicles. The length of these lanes must accommodate turning demand such that left-turn traffic (1) is able to enter the turn lanes behind through queues or (2) can be stored in the turn lane to ensure the through lane traffic is not blocked. When left-turn lanes are not present, a shared lane exists which is included in the number of through lanes.

When analyzing arterials without left-turn lanes, the use of the Generalized Service Volume Tables is discouraged in all but the most basic analyses. If used, the Generalized Service Volume Tables include adjustment factors for the absence of left turn-lanes. To account for the absence of left-turn lanes, adjustment factors provided in the Generalized Service Volume Tables must be manually applied to the service volumes. However, the user is cautioned that research indicates that the true value of the reduction is highly dependent on the distribution of traffic volumes among all the various movements, and a constant reduction factor, as used in the tables is not accurate.

Storage length refers to the total amount of storage available for left-turning vehicles, measured in feet. The default value is 235 feet. For new turn lanes, FDOT Design Standards must be consulted (found at https://www.fdot.gov/design/standardplans/DS.shtm).

EXCLUSIVE RIGHT-TURN LANES

Exclusive right-turn lanes are storage areas designated to exclusively accommodate right-turning vehicles.

The length of these lanes must be able to accommodate turning demand to allow for the free flow of the through movement. The number of pedestrians crossing at these locations should also be considered and accommodated.

4.7. Roadway Lengths

To properly apply the Generalized Service Volume Tables, it is necessary to partition roadways into appropriate lengths for analysis. Setting lengths too short may not adequately capture traffic flow characteristics. Vehicles will not achieve the same average running speed on a segment as over a longer facility length. Short lengths would also be subject to bias caused by signal control delay.

Furthermore, analysis results would not conform to the concept of LOS that is based on the driver perception of the operation of roadways and may not show where the most significant impact of proposed development traffic will occur. Conversely, setting lengths too long may dilute the impact of hot spots by averaging them into other portions that operate better.

FDOT District LOS Coordinators have primary responsibility for the segmentation of the State Highway System (SHS) for LOS purposes. FDOT Central Office may combine smaller segmentation lengths of a facility for statewide reporting and other purposes.

In general, the partitioning of roadways for facility analyses should be based on the following considerations, ranked in order:

- Highway system structure (including facility type, number of lanes, etc.)
- Area type boundaries
- Lengths
- AADTs

At the local level, government agencies frequently make highway capacity and LOS termini at their own jurisdictional boundaries, regardless of the appropriate facility length and termini considerations described above. Jurisdictional boundaries by themselves are usually not appropriate termini for capacity and LOS analyses. Local governments are encouraged to consult with FDOT District LOS Coordinators for applicable segmentation within their jurisdictional boundaries.

4.7.1. Arterials

For an arterial facility analysis, the general recommendation is that the facility be at least two (2) miles in length to use the service measure of average travel speed. Major intersecting arterials frequently serve as logical breaks in segmenting the arterial facility. In downtown areas, the general recommended length is at least one (1) mile.

When evaluating arterial section or facility LOS for planning, the roadway should begin and end at a signalized intersection. The following guidance is provided for some special cases:

(1) Interchanges along an arterial: At a generalized planning level, it is typically appropriate to make a break at an interchange (highway system structure criterion) that does not include a signalized intersection.

(2) Boundaries, especially urbanized area boundaries: When a signalized intersection lies just outside the boundary, it is proper to extend an analysis to the next signalized intersection if within 2 miles of a boundary for a conceptual planning analysis. For example, if a signalized intersection lies 1 mile beyond the existing urbanized boundary in a transitioning area, it is appropriate to include that signalized intersection and the 1 mile of transitioning area as part of an urbanized area analysis.

5 Traffic Variables

This chapter provides an overview of key traffic variables used in the development and use of the Generalized Service Volume Tables.

5.1. Volume and Demand

Traffic volume is the most basic of all traffic parameters and is generally defined as the number of vehicles passing a point on a transportation facility during a specified time period. Traffic volumes typically are developed separately from capacity/LOS analyses and provide input to those analyses. Various sources that determine traffic data include:

- FDOT's Florida Traffic Online (FTO) Web Application
- Extrapolation of historical growth trends
- FDOT's travel demand forecasting models
- Institute of Transportation Engineers (ITE) Trip Generation Manual

The sources listed below provide guidance on traffic forecasting and analysis:

- FDOT's Project Traffic Forecasting (PTF) Handbook
- HCM, Sixth Edition
- FDOT's Traffic Analysis Handbook

Volume is the parameter most often used to quantify traffic demand. **Traffic demand is the number of vehicles with drivers who desire to traverse a particular highway during a specified time period. While traffic demand expresses a desire, volume typically represents actual measurement.**

Misuse of measured volumes often occurs in capacity/LOS analysescausing traffic studies to report the observation and measurement of conditions as they presently exist. Current observations do not reflect constraints in the existing highway system that may prevent vehicles from accessing a desired segment of the system at any given point in time. Observed volumes on congested facilities are more a reflection of capacity constraints than of true demand.

Measured traffic volume cannot theoretically exceed roadway capacity, but traffic demand volume can exceed capacity. An example of a common misinterpretation of these two distinct terms typically occurs while collecting traffic data at an oversaturated intersection. The traffic volume that can physically be processed through a traffic signal is a measure of the capacity (or supply). When traffic volumes approach roadway capacity, the transportation system may experience abnormally long vehicle queues and excess vehicular delay. The length of the vehicle queue upstream of a traffic signal is a more accurate measure of the traffic demand that cannot be processed in the one-hour analysis period.

The impact of bottlenecks, alternative routes, latent demand, and future growth further complicates the relationship between measured traffic volume and traffic demand. **If questions arise as to the appropriateness of using measured volumes or demand volumes for capacity and LOS analyses, it is clear demand volumes should be used.**

5.2. Annual Average Daily Traffic (AADT)

AADT is the total volume of vehicle traffic on a highway or roadway segment for one year divided by the number of days in the year. Most planning applications require AADT volumes. Determining AADT values is a separate process and distinct from capacity/LOS analyses. FDOT routinely provides AADT values for state roads.

AADT values are easy to confuse with two other traffic count numbers that are used to estimate AADT. **The average daily traffic (ADT) is the total traffic volume during a given time period, more than a day and less than a year, divided by the number of days in that time period.** ADT is generated from a short-term traffic count and can be used to estimate AADT. Ensuring ADT counts are reflective of the normal average traffic is an important consideration when using them to estimate AADT on the roadways. Traffic taken during a four-day holiday, long weekend, or Saturday night when 50,000 or more football fans gather is not a normal occurrence.

Peak season weekday average daily traffic (PSWADT) is the average weekday traffic during the peak season. PSWADT numbers are normally generated by travel demand forecasting planning models, such as Florida Standard Urban Transportation Model Structure (FSUTMS). Like ADT, they can be converted to AADT by an adjustment factor.

FDOT operates two types of traffic monitoring programs: 1) continuous monitoring at selected locations using permanently installed equipment and 2) coverage counts at many temporary or short term sites using portable equipment. Further information about the traffic monitoring programs can be found in the FDOT PTF Handbook.

There are two count adjustment factors used to calculate AADT. The first, **axle correction factors are used to compensate for an axle counter's tendency to count more vehicles than are actually present.** For example, an axle counter would show a count of two when a four-axle truck runs over the sensor, even though only one vehicle is present. The second, **seasonal adjustment factors have been developed to adjust for the variation in traffic over the course of a year.** The peak season is the 13 consecutive weeks with the highest volumes. The weekly seasonal factors for those weeks will be the lowest, and the factors will be the highest for the weeks with the lowest volumes. The seasonal factor is used as follows:

AADT = (short-term traffic count) x (seasonal factor) x (axle correction factor)

Although, for planning purposes AADT is usually used, actual capacity and LOS analyses are conducted on an hourly or sub-hourly directional basis. All of FDOT's Generalized Service Volume Tables are based on peak hour directional roadway, traffic, control, and multimodal characteristics. FDOT's hourly directional tables may be viewed as the most fundamental of the tables, because the daily tables are created by dividing the peak hour directional values by the directional distribution factor (D) and the planning analysis hour factor (K). Although the determination of AADT is outside the capacity/LOS analyses, the determination of K and D is a fundamental part of capacity/LOS analyses in planning stages because of the need to convert AADT to peak hour directional volumes.

5.3. Planning Analysis Hour Factor (K)

The K factor is the ratio of the traffic volume in the study hour to AADT. Historically, FDOT has used a variety of study hours and K factors depending on the application. Frequently used K factors included the 30th highest volume hour of the year (K30), 100th highest volume hour of the year (K100), highest hourly volume to daily volume (Kp/d), 5–6 p.m. weekday volume to AADT (K5-6pm), average p.m. weekday peak volume to AADT (Kpm), average a.m. peak weekday volume to AADT (Kam), and noon weekday volume to AADT (Knoon). In general, K factors are used for peak hour traffic analyses, but analyses can also be based on low-volume conditions, such as the analysis of truck travel in early morning hours. Roadway, traffic, and control conditions vary considerably during the day, potentially affecting capacity values and service volume thresholds.

Standard K is the primary planning analysis hour factor used in Florida, and the value is set based on the area type and facility type. The use of Standard K represents a design approach in which the K factor for a roadway is established from the planning phase through the design phase of the project development process. Rather than being a variable, Standard K values are a fixed, cost-effective parameter, much like the use of 12-foot through lanes on major, high-speed roadways. Unless otherwise noted, all references in this Q/LOS Handbook that refer to a study hour or K factor refer to Standard K.

The Standard K factor is used to convert a peak hour volume to an AADT and vice versa. The Standard K factors used in the Generalized Service Volume Tables were obtained through a methodical process to obtain representative Standard K factors. On the freeways in the seven largest urbanized areas in Florida (Fort Lauderdale, Jacksonville, Miami, Orlando, St. Petersburg, Tampa, and West Palm Beach), Standard K represents a peak study period. For all other facilities, Standard K represents a peak hour not within the peak season. Standard K Factors for planning and design analysis are not directly applicable to the Turnpike, other toll roads, and managed lanes. For more information on the K Factors, refer to FDOT's PTF Handbook.

The K factor generally drops as an area becomes more urbanized and high traffic volumes are spread out over longer time periods. If adequate documentation is provided, FDOT would consider deviations from the Standard K table for special facility types.

The recommended Standard K factors can be found in the FDOT PTF Handbook and the analyst must refer to the PTF Handbook for use of appropriate K factors in projects. The K values used in development of the Generalized Service Volume Tables included in this handbook are consistent with the PTF Handbook. They are listed below:

- Urbanized (Core urbanized/Core freeways)
  - Freeways: 0.09 (0.085)
  - Highways: 0.090
  - Arterials: 0.090
- Transitioning
  - Freeways: 0.098 (average of Transitioning to Urbanized Areas and Urban)
  - Highways and arterials: 0.090
- Rural developed and rural undeveloped
  - Freeways: 0.105
  - Highways and arterials: 0.095

Standard K values on freeways in large urbanized areas range from 8.0 to 9.0 percent, while Standard K values on these "core freeways" in large urbanized areas are typically lower in this range. The lower K values signify a peak period, as opposed to a peak hour. The urban core freeway K values in large urbanized areas are available on FDOT FTO Web Application managed by FDOT's Transportation Data and Analytics (TDA) Office.

5.3.1 Multimodal Transportation Districts (MMTD)

The purpose of MMTDs is to encourage desirable transportation environments for all users, including transit passengers, pedestrians, cyclists, and motorists. The designation of such districts recognizes the inherent, integral relationship between transportation, land use, and urban design and the degree to which each of these elements affect the others. Local governments opting to designate an MMTD assign secondary priority to vehicle mobility and primary priority to assuring a safe, comfortable, and attractive pedestrian environment, with convenient connections to transit. FDOT supports local governments that are committed to such efforts. Implementing MMTDs should help foster the use of multiple modes of transportation, leading to a reduction in automobile use while maintaining high mobility characteristics in the area.

The primary way FDOT supports these designated areas is through its LOS targets. FDOT promotes lower acceptable automobile travel speeds for longer durations in the planning, design, and operations of its facilities.

5.4. Directional Distribution Factor (D)

The peak hour D factor is the proportion of an hour's total volume occurring in the higher volume direction.

The preferred approach to obtain D factor data is from the FTO Web Application, which provides a D factor for all state roads. The FTO Web Application reports the average of measured D values around the 200th highest hour from nearby and comparable roadway sites. The statewide minimum acceptable D factor is 0.51 (this is not the default valueand should only be used in an LOS analysis if adequate justification is provided for the specific roadway). The D factor of 0.55 was used in the Generalized Service Volume Tables for all facility and area types. Using such an approach provides statewide consistency and reasonable accuracy in the values indicated and at a minimum cost. Additional guidance and the recommended range of D factors can be found in the FDOT PTF Handbook.

5.5. Peak Hour Factor (PHF)

The peak hour factor (PHF) is the hourly volume divided by the peak 15-minute rate of flow within the peak hour, specifically:

$$\boldsymbol{PHF = \frac{(Hourly\ Volume)}{4(Peak\ 15 - minute)}}$$

The planning-level approach for addressing volume variations within the study hour has been adopted within this handbook. PHF based on area type were used to develop the vehicular service volumes in this Q/LOS Handbook. The PHF associated with each area type is:

- Urbanized areas**:** 0.95
- Transitioning/urban areas**:** 0.92
- Rural areas**:** 0.88

The PHF associated with the area type is consistent with the sixth edition of the HCM. For more information on the PHF, refer to FDOT's PTF Handbook.

5.6. Base Saturation Flow Rate

The HCM uses the term "base saturation flow rate" for interrupted flow roadways and capacity, or base capacity, for uninterrupted flow roadways to describe the maximum steady flow. **Base saturation flow rate is the maximum steady flow rate, expressed in pcphpl, at which passenger cars can cross a point on interrupted flow roadways.** These are not the same as capacity, as normally used to define how many vehicles a roadway can reasonably accommodate. The base saturation flow rates/capacities for Florida's roadway facilities are:

- Arterials and other interrupted flow facilities: 1,950 pcphpl (assuming 100 percent green time)
- Basic freeway segment (70 mph free flow speed): 2,400 pcphpl
- Uninterrupted flow multilane highway segments (60 mph free flow speed): 2,200 pcphpl
- Uninterrupted flow two-lane highway segments: 1,700 pcphpl

5.7. Heavy Vehicle Percent

The FHWA has a vehicle classification scheme in which vehicles larger than a pickup truck are considered heavy vehicles. This includes vehicles with more than four wheels or a classification group of four or higher. **The percentage of these heavy vehicles in a given hour is frequently referred to as a truck factor (T).** However, to be more consistent with HCM terminology and to overcome some definitional problems with the common understanding of the meaning of a truck, this Q/LOS Handbook uses the term "heavy vehicle" and makes use of the percent of heavy vehicles in a given hour.

The heavy vehicle percentage varies dramatically by the time of day, day of week, roadway type, and adjacent land uses. Operational characteristics of heavy vehicles also vary dramatically by type of heavy vehicle (e.g., a relatively small delivery truck compared to a fully loaded 18-wheel semi-truck) and whether they are operating on an uncongested freeway or on signalized roadways. The blast effect of heavy vehicles on bicyclists also varies significantly based on the type and speed of heavy vehicles.

5.8. Speed and Capacity Adjustment Factors

The HCM 6th Edition has replaced the local adjustment factor (LAF) with the SAF and CAF. The LAF previously provided an adjustment to capacity to account for driver aggression, hurriedness, and familiarity with the facility.

The SAF is used to adjust the speed of a facility based on a combination of sources, including weather and construction work zone effects. The SAF may also be used to calibrate the estimated free-flow speed for local conditions or other effects that contribute to a reduction in free-flow speed.

The CAF is used to adjust the capacity of a facility for reduced-capacity situations or to match field measurements. The capacity can be reduced to represent situations such as construction and maintenance activities, adverse weather, traffic incidents, and vehicle breakdowns.

The SAF and CAF can be used to adjust for driver familiarity (or unfamiliarity) with the facility. Additionally, these adjustment factors are used to calibrate a roadway to existing conditions. For the Generalized Service Volume Tables analysis, an SAF of 0.975 and a CAF of 0.968 was assumed for all analyses and area types. These values are derived from the HCM 6th Edition.

5.9. Percent Turns from Exclusive Turn Lanes

Percent turns from exclusive turn lanes is the percent of vehicles approaching an intersection served by an exclusive turn lane or lanes. More specifically, the percent left turns is the percentage of vehicles performing a left-turning movement at a signalized intersection, and the percent right turns is the percentage of vehicles performing a right-turning movement at a signalized intersection. Typically, the percent turns from an exclusive lane is the percent of traffic using an exclusive left-turn lane, with traffic predominantly moving straight ahead.

Some of the most complicated calculations within the HCM chapter on signalized intersections deal with accommodating left-turn movements. **The Generalized Service Volume Tables assume that left-turn lanes adequately serve left-turning vehicles.** In other words, the base condition assumes there is no queue spillback from the left-turn lane into the adjacent through lanes. If this assumption cannot be made, results obtained from the planning analysis tools are possibly inaccurate. For these reasons and more, the tables should not be used for intersection design or detailed traffic operations analysis.

The automobile LOS methodology described in this Q/LOS Handbook applies the HCM procedures to through traffic at each signalized intersection. Turning movement adjustments are made internally, based on the user-specified value of percent turns from exclusive lanes. Turning volumes are added to the through volumes to determine the overall service volumes shown in the Generalized Service Volume Tables.

The accuracy of LOS calculations is highly dependent on the percent turns from exclusive turn lanes. Although it is typically of moderate importance, at some key intersections, it may be one of the most significant variables. While FDOT does not routinely suggest acquiring percent turns from exclusive turn lanes, data collection should be considered at key intersections. Furthermore, some FDOT districts may require specific counts. If the percent turns at key intersections are obtained in the field, a value of 10 percent may be assumed for the other intersections, assuming an exclusive left-turn lane and no exclusive right-turn lane. If the percentage of turns from exclusive turn lanes is acquired, the turning movement count should be conducted during the peak hour, as illustrated in **Table 5-1**.

Table 5-1: Calculation of Percent Turns from Exclusive Turn Lanes

Measured Day	Peak Hour	Signalized Intersection	Total Peak Hour Predominant Approach Volume	Exclusive Lane Volume	% Turns from Exclusive Turn Lanes	
					A	B
22-Jan	4-5 PM	A	884	130	14.7%	16.7%
		B	900	150		
23-Jan	5-6 PM	A	1,152	150	13.0%	13.0%
		B	1,150	150		
24-Jan	5-6 PM	A	1,102	150	13.6%	14.7%
		B	1,090	160		
Totals	–	A	3,138	430	13.7%	14.6%
		B	3,140	460		

SPECIAL TURNING MOVEMENT CASES

There are two special cases when dealing with turns from exclusive lanes. The first is when the predominant movement is a turn movement instead of the straight-ahead movement. The second involves T intersections.

In **Figure 5-1**, the predominant movement is the left-turning movement, and the 550 vehicles turning left should be considered the through movement.The 200 vehicles going straight ahead should be treated as left-turning vehicles with 20 percent left turns [(200/(550 + 200 + 250)] from an exclusive left-turn lane. The 250 vehicles turning right should be treated normally, with 25 percent right turns [(250/(550 + 200 + 250)] from an exclusive right-turn lane.

In **Figure 5-2**, all vehicles are turning from exclusive turn lanes at a T intersection. The 600 vehicles turning right is the predominant movement and should be considered through vehicles. The 400 vehicles turning left should be treated normally, which is to say there are 40 percent left-turns [400/(400 + 600)] from an exclusive left-turn lane.

In **Figure 5-3**, another T intersection is shown, featuring a shared left/through lane in addition to the predominant movement served by the exclusive right lane. Normally, a shared left/through lane does not have the same capacity as a through lane because of the effect of opposing vehicles blocking permitted left turns for the main movement. However, in this case, there is no opposing movement, and the capacity of this shared lane is virtually the same as a typical through lane. In this situation, an analyst should assume one through lane and one shared through lane with 20 percent left turns [(200/(200 + 200 + 600].

Figure 5-1: Predominant Turning Movement

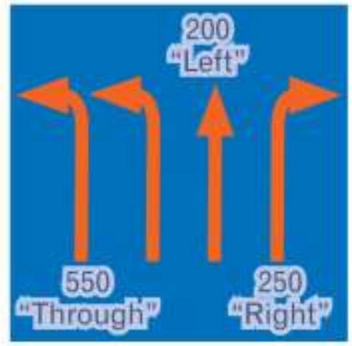


Figure 5-2: Through Movement at a T Intersection with Exclusive Lanes

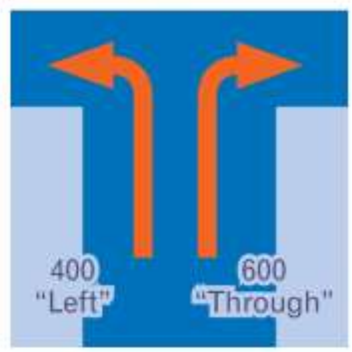
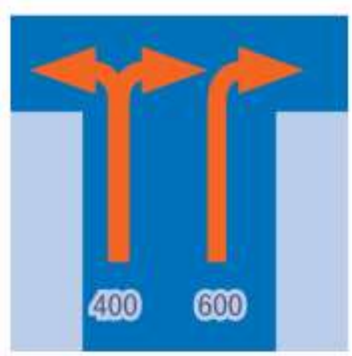


Figure 5-3: Through Movement at a T Intersection with Shared Lanes



6 Control Variables

This chapter provides an overview of each control variable used to generate the Generalized Service Volume Tables.

Control variables refer to roadway or area traffic controls and regulations in effect for a roadway point or segment, including the type, phasing, and timing of traffic signals, stop signs, lane use and turn controls, and other similar measures. In this Q/LOS Handbook, control variables refer to those regularly occurring at signalized intersections, unless otherwise noted. For uninterrupted flow facilities, such as freeways and highways, the LOS can readily be derived from the volume of vehicles and roadway capacity, and control variables are not applicable. For signalized roadways (interrupted flow), however, v/c is not sufficient to determine the LOS, and control variables must be considered. These include:

- Number of signals
- Arrival type
- Cycle length
- Effective green ratio (g/C)

The Generalized Service Volume Tables use default control variables that are representative of typical conditions on Florida roadways. The default control variables (or characteristics) — along with the roadway, traffic, and multimodal variables assumed in the creation of each table — are provided on the back of the Generalized Service Volume Tables.

Table 6-1 provides an overview of the control variable input requirements within the Generalized Service Volume Tables.

Table 6-1: Control Variable Input Requirements

	Input Variable	Generalized Service Volume Tables
CONTROL	Number of Signals	D
	Arrival Type	D
	Signal Type	D
	Cycle Length (C)	D
	Through Effective Green Ratio (g/C)	D
	Exclusive Left Effective Green Ratio	D

Legend: D Default variables that cannot be altered

The effects that individual variables have on the computational process vary. **Table 6-2** indicates the sensitivity of the control variables on capacity and LOS.

Table 6-2: Sensitivity of Control Variables on Service Volumes

Control Variable	Sensitivity on Service Volumes
Number of Signals	high
Arrival Type	medium
Signal Type	low
Cycle Length (C)	medium
Through Effective Green Ratio (g/C)	high
Exclusive Left Effective Green Ratio	medium

Traffic variables, including AADT, Standard K, and D data, should be obtained from FDOT's FTO, PTF Handbook and field counts. Although turning movement counts at key intersections may be necessary, as discussed previously, FDOT does not recommend the use of travel time studies for LOS planning applications.

Field visits should be conducted to collect traffic and other items needed for analyses. Up-to-date aerial or satellite imagery may be sufficient for most of the data entry items. Signalization information is often available from the applicable traffic operations agency's signal timing plans. The applicable transit agency should be contacted for transit data.

6.1. Number of Signals

The cumulative effect of numerous traffic signals, lack of green time, and lack of effective signal progression often have a detrimental effect on the LOS of arterials. An important feature of FDOT's Generalized Service Volume Tables is the inclusion of the number of signals on the determination of the LOS.

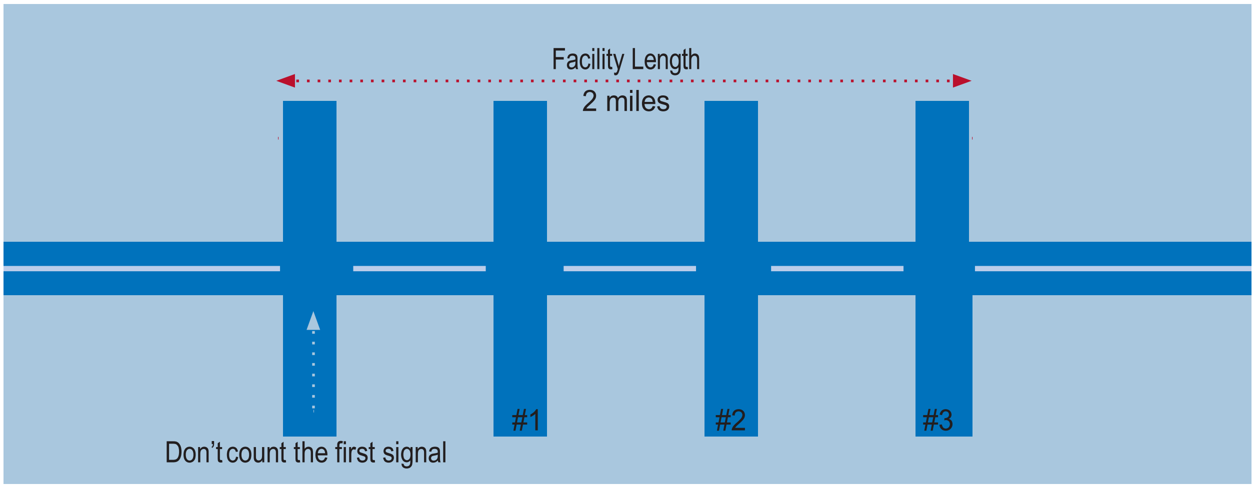
The distance between signalized intersections is required to determine specific service volumes for a roadway. FDOT's Generalized Service Volume Tables use signalized intersections per mile as an input and assume uniform spacing. While this approach may be acceptable for an areawide analysis, precise distances between signalized intersections should be determined when an individual roadway is analyzed at the conceptual planning level.

For analysis purposes, 100 feet between signalized intersections is considered the minimum distance. When the actual distance is less than 100 feet (e.g., side streets with wide medians), it is reasonable to consider these together as one signalized intersection.

Roadway and traffic characteristics often change over time. The number of signals per mile is frequently the most significant change. As development takes place and an area becomes more urbanized, the number of signals per mile is likely to increase. The LOS analysis of future conditions should, therefore, take into account changes in roadway and signalization characteristics.

To avoid double counting when determining the number of signals, only one intersection at the ends of the facility should be counted, as shown in **Figure 6-1**. In general, FDOT recommends including the last intersection within the analysis and ignoring the first, or entry, intersection. This allows the analysis to include the effects of delay, backup, and the LOS from the last intersection for the facility under study.

Figure 6-1: Total Number of Signals



For example, in southeast Florida, principal arterials are often spaced 1 mile apart, with other signalized intersections in between. In this situation, only one of the signalized intersections at the ends of the roadway, plus the signals in between, should be counted when determining the number of signals per mile. In general, the last signalized intersection in the peak flow direction would be counted, ignoring the first signalized intersection.

As discussed previously, the arterial should begin and end at a signalized intersection. In unusual situations when this assumption is not applicable (e.g., lane drops, ramp junctions, etc.), the following guidance is provided:

- For the Generalized Service Volume Tables, do not count the unsignalized terminus as a signalized intersection.

In general, only fixed, periodic interruptions should be considered in determining the number of signals. Only one intersection at the ends of the facility should be counted. Draw bridges, at-grade railroad crossings, school zones, pedestrian crossings, and median openings should not be counted. Depending on the site-specific conditions or analysis desired, there may be exceptions to this general guidance.

When using the Generalized Service Volume Tables, an intersection with a stop sign for the through movement is considered a signalized intersection for a state-signalized arterial. When analyzing a Non-State signalized roadway, the roadway must have at least one signalized intersection.

6.2. Arrival Type

Arrival type is a general categorization of the quality of signal progression. The HCM defines six arrival types, with Type 1 representing the worst progression quality and Type 6 representing the best. Uncoordinated operation, or random arrivals, is represented by Type 3 and is appropriate for actuated signals. Arrival Type 4 is FDOT's default for coordinated signal systems. A more favorable progression (Types 5 or 6) may be appropriate when progression design strongly favors the peak direction of travel, and all signals are coordinated for the length of the facility. One-way facilities tend to have better quality progression than two-way facilities. A higher level of progression may also be appropriate around freeway interchanges, where signals are typically highly coordinated. The arrival type may vary significantly from one signal to the next, even in coordinated signal systems. Actuated-coordinated signals have varying green times, with breaks between groups of coordinated signals.

The assumption of very good progression in one direction does not imply efficient progression in the other direction. Even with less traffic volume, off-peak direction speeds could be lower, if favorable progression has been established for the peak direction only.

6.3. Signal Type

The signal type indicates the degree to which a traffic signal's cycle length, phase plan, and phase times are preset or actuated. The three main types are:

- Actuated
- Actuated-coordinated
- Pretimed

It should be noted that modern traffic signals can handle multiple settings and can vary by time of day. Consequently, a traffic signal's operation (actuated, coordinated-actuated, or pretimed) can change by the time of day to best meet traffic demands.

6.3.1. Actuated

Actuated, or fully actuated signals, use vehicle detection for all signal phases on the main and side street approaches. Each phase is subject to a minimum and maximum green time, and some phases may be skipped if there is no demand for the phase. The length of the green time observed in the field generally depends on the amount of vehicular demand for the phase. If there is little demand, then a relatively short green time will be allocated to the phase. If there is significant demand, a relatively long green time will be allocated, subject to the maximum green time for that phase. The minimum and maximum green times for each phase can be easily changed by entering new values into the traffic signal controller.

Because phases can be skipped, and the amount of green time for each phase generally depends on demand, the cycle length will often vary substantially from cycle to cycle. The exception occurs during periods of heavy vehicular demand, when all phases consistently reach their maximum values, making it seem as if the cycle length is fixed. Actuated signal operations are most frequently used when the signalized intersection is isolated, or when there is a desire to minimize delay without concern for progression.

6.3.2. Actuated-Coordinated

A subset of actuated control is referred to as actuated-coordinated control. **In this type of signal operation, the cycle length is typically fixed, while the amount of green time for the main street through phase varies.** It consists of a minimum amount of green time plus any unused time from the minor phases. Holding the main street green in this manner at all of the signals along a facility allows platoons of vehicles to move relatively unimpeded along the main street with decent progression. Actuated-coordinated signal operations are typically used in Florida's developed areas, especially during peak travel times. This type of operation typically offers the best balance of capacity and progression for the main street through movement.

6.3.3. Pretimed

Pretimed signals use a preset sequence of phase times in a repetitive order and make no use of vehicle detection. Each phase is green for a fixed period of time, irrespective of vehicular demand, and none of

the phases can be skipped. Thus, the cycle length is fixed. This type of signal operation is most frequently used in downtown areas with high signal density, or when the desire is to maximize progression without extensive concern about maximizing capacity for the through movement.

6.4. Cycle Length (C)

Cycle length (C) is the total time for a signal to complete a sequence of signal indications for all traffic movements. The cycle lengths used in the development of the arterial service volume tables were based on representative cycle lengths for different functional classifications of arterials and for different area types. Cycle lengths are typically highest on principal arterials in urbanized areas, where the primary purpose of the facility is to provide a high level of mobility to through movements on the mainline and where roadways are typically at or near capacity during peak periods. Lower cycle lengths are typically used for the less saturated conditions typical of rural areas to provide better access and service to all directions. The cycle lengths used to develop the Generalized Service Volume Tables are provided on the back of each table.

6.5. Effective Green Ratio (g/C)

One of the most significant variables used in calculating the highway capacity and LOS on a signalized roadway is the through movement's effective green time (g) to signal cycle length ratio (g/C). It is the amount of time allocated for the through movement (typically calculated as the green plus yellow plus all-red indication times less the lost time) divided by C. Along with the number of through lanes, it is usually one of the two most important factors for determining the capacity of a roadway's through movement at any given intersection and for the roadway as a whole. Despite this, for generalized analyses, g/C is often ignored, because:

- g/C ratio typically varies from intersection to intersection along an arterial
- g/C ratio typically varies by time of day

Ignoring g/C undermines any arterial LOS analysis at a generalized planning level. This Handbook includes guidance to provide default g/Cs for generalized planning arterial analyses.

A major simplifying assumption that is essential to the development of the Generalized Service Volume Tables is the selection of one g/C for all intersections on an arterial. The g/C ratio of 0.44 was used for arterial analysis for all area types. FDOT has determined that for generalized planning analyses, the weighted average g/C ratio yields the closest results to actual conditions. **The weighted g/C ratio of an arterial is the average of the critical intersection through movement g/C ratio and the average of all the other intersections through movement g/C ratios for urban streets.** For example, if there are four signals with a through g/C ratio of 0.50 and one signal with a through g/C ratio of 0.40, then the weighted average g/C ratio for urban street is 0.45 (Refer to HCM for additional information). Essentially, the worst intersection is given equal weight to all the other intersections combined.

As an example, for the through movement phase, G is the green displayed time, Y the yellow displayed time (typically 3 or 4 seconds), R the all-red indication (typically 1 or 2 seconds), and C the cycle length. The most representative situation in Florida is for cycles to consist of four phases and 12 indications: one phase each to accommodate the main road through movement, the side road left movement, the side road through movement, and the main road left movement, with G, Y, and R indications for each of the four phases. The effective green time, which includes the effects of vehicular startup and clearance lost times is g.

FDOT's preferred approach for g/C determination for current year analyses is to use the actual signal timing plan from the traffic operations agency for the p.m. peak hour (typically 5–6 p.m.) for each signalized intersection. This is a consistent and cost-effective approach that provides reasonable accuracy. If the signal is actuated, (G + 4)/C should be used for the through movement. This assumes the typical Y + R time of 4 seconds as additional time allocated to the through movement as a result of unused time from the other movements. If the signal is pretimed, the g/C for the through movement should be used.

For consistency and ease of review, FDOT recommends using signal timing plans from the applicable traffic operations agency.

Analysts should be aware that signal timing plans come in a variety of forms, use many notations, and are not designed to directly address the determination of g/C. It may be necessary to coordinate with the operating agency directly to interpret the output values.

Analysts should calculate and input g/C for the through movement at all intersections. The g/C for left turning movements need only be collected at major intersections. A 10 percent value can be assumed as the left g/C for other intersections.

In previous FDOT guidance, FDOT offered two other methods for determining g/C:

- actual signal timings from the traffic operations agency
- field studies

Both approaches have some merit; however, after FDOT analyzed and tested both approaches, the preferred approach of using signal timing plans in general offers the best combination of consistency, accuracy, and cost-effectiveness. The use of field studies for g/C is discouraged, unless an early agreement by the affected parties is reached. The maximum acceptable facility through movement g/C ratios during the peak hour typically should not exceed:

- State principal arterials
  - Current year: 0.50
  - Long term (≥ 10 years out): 0.47
- Other roadways: 0.44

Under most circumstances, arterial facilities are 1.5–5.0 miles in length and include principal arterials as terminus points. The g/C value of 0.50 approximates FDOT's maximum allowable arterial capacity volumes of 1,000 vehicles per hour per lane (vphpl) and 950 vphpl in large urbanized areas and other urbanized areas, respectively.

7 Multimodal Variables

This chapter provides an overview of each multimodal variable used within Generalized Service Volume Tables to allow the user to recognize these variations and analyze multimodal LOS on specific roadways. Where applicable, generally acceptable ranges are provided. Multimodal variables describe the various geometric and demand characteristics that are needed to determine pedestrian, bicycle, and bus LOS. As with the control variables, multimodal variables are only applicable for arterial analyses:

- Paved shoulder/bicycle lane
- Outside lane width
- Pavement condition
- Sidewalk
- Sidewalk/roadway separation
- Sidewalk protective barrier
- Bus frequency
- Bus stop amenities
- Bus stop type
- Passenger loads

Table 7-1 provides an overview of the multimodal variable input requirements within the Generalized Service Volume Tables.

Table 7-1: Multimodal Variable Input Requirements

Input Variable	Generalized Service Volume Tables
Paved Shoulder/Bicycle Lane	R
Outside Lane Width	D
Pavement Condition	D
Sidewalk	R
Sidewalk/Roadway Separation	D
Sidewalk/Roadway Protective Barrier	D
Bus Frequency	R
Bus Stop Amenities	D
Bus Stop Type	D
Passenger Loads	D

Legend: R Required table input
D Default cannot be altered

The effects that individual variables have on the computational process vary. **Table 7-2** indicates the sensitivity of the multimodal variables on the capacity and LOS.

Table 7-2: Sensitivity of Multimodal Variables on Service Volumes

Control Variable	Sensitivity on Service Volumes
Paved Shoulder/Bicycle Lane	high
Outside Lane Width	low
Pavement Condition	low
Sidewalk	high
Sidewalk/Roadway Separation	medium
Sidewalk/Roadway Protective Barrier	medium
Bus Frequency	high
Bus Stop Amenities	low
Bus Stop Type	low
Passenger Loads	low

7.1. Paved Shoulder/Bicycle Lane

Within this Q/LOS Handbook, a bicycle lane is a designated or undesignated (paved shoulder) portion of a roadway for bicycles adjacent to vehicle lanes. Painted lines separate paved shoulders/bicycle lanes from vehicle lanes.

For planning purposes, a designated bicycle lane is usually 4 to 5 feet in width and has a bicycle logo. An undesignated bicycle lane is usually 4 feet in width and does not have a bicycle logo. To be considered a paved shoulder/bicycle lane, at least 3 feet of paved shoulder must exist outside the painted line. Facilities with striped shoulders between 1 and 3 feet should be considered as having wide outside lane widths.

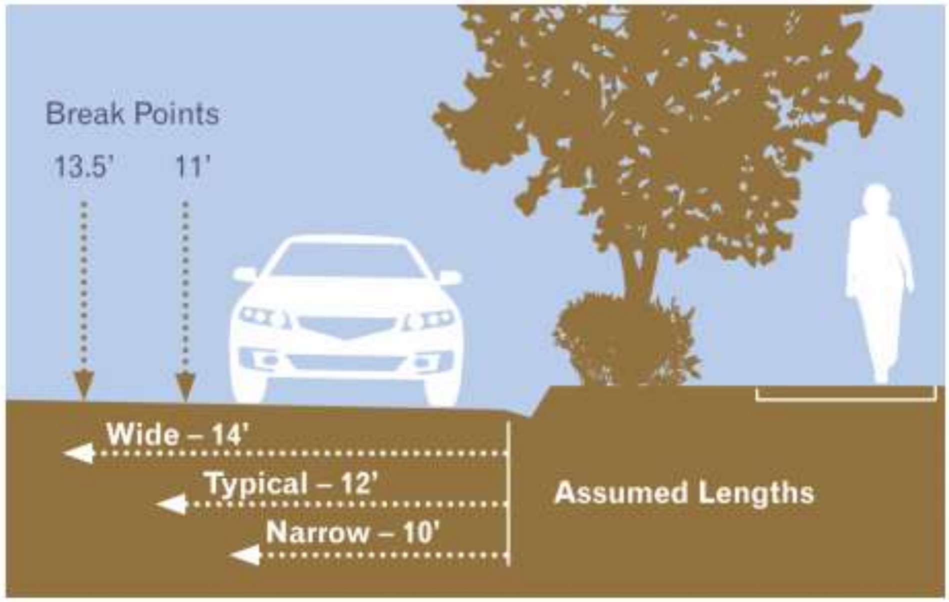
7.2. Outside Lane Width

Within this Q/LOS Handbook, **the outside lane width is the width, in feet, of a roadway's outside vehicle through lane, not including the gutter.** This factor is usually important in the determination of a roadway's BLOS. The majority of the SHS lane widths are 12 feet. Many local roads and some state highways have 14-foot outside lanes; these are sometimes referred to as wide curb lanes. Many other local roads and some state facilities have outside lane widths less than 12 feet.

These dimensions as shown in **Figure 7-1,** are for planning analyses only:

- Wide: greater than or equal to 13.5 feet.
- Typical: greater than or equal to 11 feet and less than 13.5 feet.
- Narrow: less than 11 feet.

Figure 7-1: Outside Lane Width



7.3. Pavement Condition

Pavement condition for BLOS analysis is a general classification of the roadway surface where bicycling usually occurs, not necessarily that drivers of vehicles experience. Three general classifications are used: desirable, typical, and undesirable. These general classifications are used in lieu of detailed pavement surface grades found in the operational model on which this planning technique is based.

- Desirable pavement condition is new or recently resurfaced pavement. The pavement still maintains a dark black color, is free of cracks, and rides smoothly.
- Typical pavement condition is the most common type of pavement condition of Florida's roadways and is used in the Generalized Service Volume Tables. Generally, the pavement has a light gray color, the surface appears worn, and may have some cracks; however, the ride for the bicyclist is smooth.
- Undesirable pavement condition consists of pavement with noticeable cracks, broken pavement, or ruts. There may be existing or partially filled potholes, or drainage grates hazardous to bicycles. When the bicycle riding surface contains loose dirt, gravel, or debris, even if the roadway surface is typical or desirable, then it would be considered undesirable.

In general, FDOT recommends the use of a typical pavement condition for most analyses, especially those involving future years.

For analysts familiar with FHWA's PAVECON factors, "desirable" would equate to a 4.5 or 5.0 rating, "typical" would equate to a 3.0 to 4.0 rating, and "undesirable" would equate to 2.5 or less.

7.4. Sidewalk

Within this Q/LOS Handbook, a sidewalk is a paved walkway for pedestrians at the side of a roadway, typically 5 feet in width. Paved roadway shoulders are not considered sidewalks. Because LOS analyses are directional, the existence of a sidewalk is based on the directional side of the arterial being analyzed.

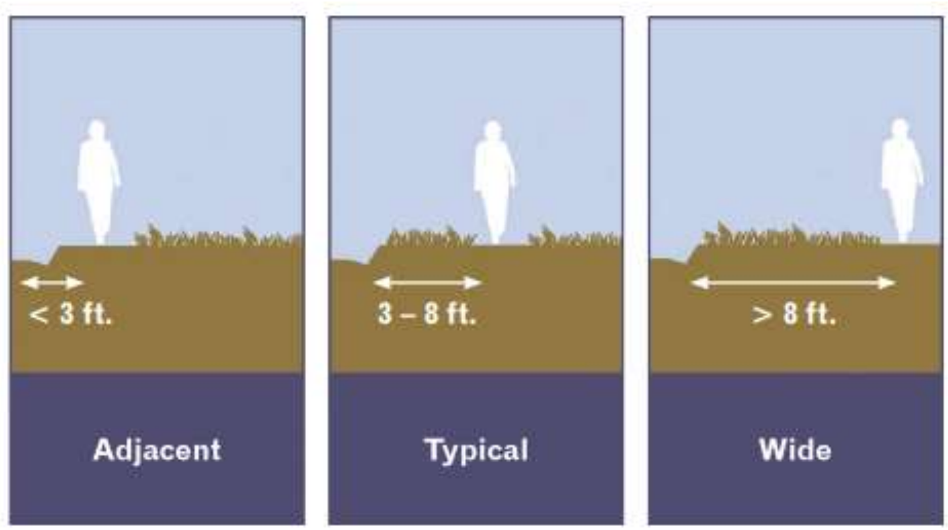
SIDEWALK/ROADWAY SEPARATION

Sidewalk/roadway separation is the lateral distance in feet from the outside edge of pavement to the inside edge of the sidewalk. Within this Q/LOS Handbook, sidewalk/roadway separation is classified in three ways, as shown in **Figure 7-2**:

- Adjacent: less than or equal to 3.0 feet
- Typical: greater than 3.0 feet and less than or equal to 8.0 feet
- Wide: greater than 8.0 feet

In general, pedestrians tend to walk toward the outer half of sidewalks, away from traffic.

Figure 7-2: Sidewalk/Roadway Separation



In downtown environments, sidewalks frequently extend at least 10-12 feet from the curb. When there are no tree plantings or other sidewalk/roadway protective barriers, sidewalks should be classified as adjacent. When there are tree plantings or some other barrier between where people walk and the outside edge of the travel lane, sidewalks are assumed to have typical separation.

When on-street parking and sidewalks both exist, the sidewalk/roadway separation should be considered wide, regardless of how close the sidewalk is to the edge of the pavement. Essentially, on-street parking adds approximately 8 additional feet between pedestrians and vehicles.

7.5. Sidewalk Protective Barrier

In addition to sidewalk width, this Q/LOS Handbook adds an overall sidewalk protective barrier factor to include the added benefits of trees, on-street parking, or other barriers.

7.6. Bus Frequency

Bus frequency, also known as headway, refers to the number of scheduled, fixed-route buses that have a potential to stop on a given roadway segment in one direction of flow in a one-hour time period. Express buses with no potential of stopping along a roadway are not included.

7.7. Bus Stop Amenities

The bus stop is often the first component of any transit system a passenger will encounter, and available amenities for comfort or safety can greatly influence the perceived QOS along a route. Rather than quantify all potential bus stop components, this Q/LOS Handbook creates four categories of bus stop amenities: excellent, good, fair, and poor. Having shelter from the weather and a place to sit is the most desirable condition at any bus stop, regardless of type, and is considered an excellent condition. A shelter without a bench represents a good condition, because rain, wind, and sun could otherwise deter choice riders. A stop with only a bench is less desirable than a stop with only a shelter and is considered a fair condition. A stop with no bench and no shelter is considered a poor condition. Because excellent bus stops may improve a user's perception of the system, the bus stop amenity factor is used to increase the adjusted bus frequency value. Bus stops with no amenities are uninviting and discourage use, and the variable is, therefore, used to decrease the adjusted bus frequency value, as shown in **Table 7-3**.

Table 7-3: Bus Stop Amenity Factors

Bus Stop Amenities	Adjustment Factor
Excellent	1.1
Good	1.0
Fair	1.0
Poor	0.9

7.8. Bus Stop Type

Bus travel speed depends not only on distances and congestion along the route, but also the number of stops and the dwell time at each stop. Typical bus stops delay a bus for around 15 seconds, while major stations with numerous boardings and alightings can add around 35 seconds of delay.

7.9. Passenger Loads

Just as traffic congestion contributes to the degradation of the LOS, crowding on buses can affect the QOS. Because overcrowded buses may reduce the overall desirability of a route, a passenger load factor is used to modify the adjusted bus frequency value, as shown in **Table 7-4**.

Table 7-4: Passenger Load Factor

Passenger Load Factor	Adjustment Factor
$<$ 30%	1.05
$<$ 70%	1.00
$\leq$ 100%	0.95
$>$ 100%	0.85

8 Future Year Analyses

Traffic and development conditions change on roadways over time. This raises questions about what input values, analysis tools, and LOS targets should be used for capacity and LOS analyses in future years. Analysis years and planning horizons vary appreciably in transportation planning. To help with understanding and for simplification in this text, **"long term" means 10 or more years from the current year, and "short term" means less than 10 years from the current year.** However, for a specific application, FDOT district LOS coordinators should be consulted for more detailed guidance.

For future year analyses, it is important to consider changes in the appropriate roadway, traffic volumes, land use, signal control, and multimodal characteristics. For example, under existing conditions in a transitioning area, signalization may be very infrequent; however, as development occurs, more signalized intersections can be anticipated and should be accounted for in future year capacity and LOS analyses. The traffic and control variables relevant to this handbook are discussed in the following sections. Refer to the FDOT PTF Handbook and the Traffic Analysis Handbook for further guidance on future year traffic development and analyses.

8.1. Change in Traffic Variables

8.1.1. AADT

Historical growth trends and the state's travel demand forecasting models are typically used for long-term traffic projections. Analysts and reviewers of capacity and LOS analyses need to agree on what future AADT values to use. Additional information can be found in the PTF Handbook.

For site impact analyses, volumes are frequently presented in terms of trips generated by the site rather than roadway-specific AADT, K, and D values. Institute of Transportation Engineer's (ITE's) Trip Generation Handbook is typically used for trip generation for site impact analyses; however, FDOT should be consulted about supplemental material. In all cases, care should be given to ensure final values are compatible with statewide Standard K and D factors.

8.1.2. Planning Analysis Hour Factor (K)

As areas become more developed, measured K values often drop, primarily for two reasons. The first is that more urban situations typically are not subject to highly volatile volumes, such as holiday traffic in rural areas. Generally, more developed areas are subject to frequent recurring volumes, such as weekday commuter traffic. The second is that as congestion develops, the spreading of the peak travel hour traffic also occurs. Refer to FDOT PTF Handbook for Standard K values used by facility type.

For future year generalized planning analyses, the Standard K values for the assumed area and facility types on the backs of FDOT's Generalized Service Volume Tables are appropriate. In the longer term, it may be necessary to determine if the area is projected to transition into a different area type over the analysis period.

8.1.3. Directional Distribution Factor (D)

For future year generalized planning analyses performed in this handbook, the D factor value for all area

and facility types is 0.55. If a site-specific analysis is conducted in the short term, FDOT's preferred approach is to use the FDOT's 200th Highest Hour Traffic Count Report from the FTO Web Application. In the longer term, some lowering of the factor may be appropriate. The analyst should refer to the D factors and their acceptable range in FDOT PTF Handbook.

8.2. Change in Control Variables

Making traffic and roadway projections into the future is a well-accepted practice for generalized planning analysis. For reasonable generalized planning analysis of signalized roadways, control variables must be addressed in the short and long terms. **Typically, the two most important control variables are the through movement g/C and signal density.**

8.2.1 g/C

Determining current and future g/Cs for a roadway is complicated, and judgments must be made. In the short and long terms:

- For Class II arterials, using the existing g/Cs is appropriate
- For Class I arterials not subject to significant development pressure, using the existing g/Cs is appropriate
- For Class I arterials incurring significant new development pressure, it is appropriate to lower through movement g/Cs
- For new individual signals, through movement g/Cs will vary greatly; however, for planning purposes, none should be assumed to be higher than 0.55

Within the HCS, an acceptable method to estimate future g/C ratios is by conducting intersection capacity analyses. The HCS will determine the required g/C ratios to progress through traffic movements on the major street, while simultaneously minimizing the delay to the minor street approaches.

8.2.2 Signal Density

As areas grow in population, additional traffic signals are frequently installed. Usually, these new signals do not significantly affect the capacity of roadways, unless they are in a previously undeveloped area or are so closely spaced that queue spillback occurs. They can play a major role in the determination of the LOS if stops occur more frequently and average travel speeds drop.

In short- and long-term analyses, it is appropriate to consider the probability of new traffic signals, especially based on proposed new developments. In the absence of specific development plans or intersecting traffic volume cross-product signalization criteria, general guidance should be used in developed areas.

In the short term:

- For Class II arterials, using the existing signalized intersection locations is appropriate
- For Class I arterials not subject to significant development pressure, using the existing signalized intersection locations is appropriate
- For Class I arterials incurring significant new development pressure, one additional signalized intersection per mile may be assumed

In the long term:

- For Class II arterials, one additional signalized intersection per mile may be assumed
- For Class I in small towns, one additional signalized intersection per mile may be assumed

Because of the wide variety of circumstances along generally uninterrupted flow highways in rural areas, no specific guidance can be given on future signal locations. However, for capacity and LOS purposes, the possibility of new signalized intersections should be considered. Because of the importance of signal density on the LOS on state roadways, for site impact applications, the number of new signals should be reviewed and approved by the FDOT district prior to use in an analysis.

Typically, other roadway, traffic, control, and multimodal variables do not have as large of an effect on the capacity and LOS as the ones addressed above. If some of these other inputs (e.g., turning movement percentages) were determined in a current year analysis, they can usually be applied to future year analysis. If these other variables were not determined for a current year analysis, the statewide default values on the backs of the Generalized Service Volume Tables may be assumed.

9 Maximum Capacity Volumes

The use of highway capacity and LOS analysis, whether applied appropriately or not, has resulted in projected traffic volumes beyond normal capacity ranges found on Florida facilities. There are multiple reasons for this, but to aid analysts and reviewers on what capacity values will normally be acceptable, FDOT has adopted a set of general guidelines. The values provided below are based on site-specific freeway studies and counts, as well as arterial maximum acceptable g/C ratios.

9.1. Arterials

For arterials, the maximum generally acceptable per-lane approach volumes are:

- Large urbanized: 1,000 vehicles per hour per lane (vphpl)
- Other urbanized: 950 vphpl
- Transitioning: 920 vphpl
- Urban: 920 vphpl
- Rural: 850 vphpl

The Maximum volumes may vary due to widely varying g/C, turning movements at intersections, and the segmentation of roadways. The maximum volumes represent a weighted g/C of approximately 0.50, which is the average of the critical g/C and the average of all other g/Cs along an urban street facility. Typically, there will be at least one principal arterial intersecting an urban street being analyzed. Such intersections are usually the critical intersections (hot spots) for an arterial analysis, and g/C ratios for the through movements are in the range of about 0.40. Although these intersections are frequently flared out to achieve greater capacity, the through movement g/C ratios cannot increase appreciably if all intersection movements are included. Therefore, the use of a 0.50 g/C ratio for determining the capacity of an urban street should represent the upper bounds of what can be reasonably expected.

Arterial facility analyses typically involve intersecting principal arterials, but section analyses may not have intersecting principal arterials. Under these circumstances, urban street through movements during peak travel hours may feature g/C ratios in the 0.50 to 0.60 range. Such values may be appropriate for segment or section analyses; however, the use of such high g/C ratios is not normally acceptable for a facility analysis and may represent an inappropriate segmentation of roadways.

Another situation in which g/C ratios may be above 0.50 is in the outlying parts of urbanized areas or in transitioning areas for both arterials and generally uninterrupted flow highways. In these areas, signals have typically been recently installed, and side traffic has not yet reached the high levels that it will in future years. Therefore, although current maximum volumes per lane may be higher than those shown above, in the future, such values will likely not be sustained and should be avoided in the arterial analysis.

9.2. Freeways

For freeway facilities and sections, the maximum volumes at 70 mph free flow speed are 2,400 pcphpl as per HCM.

Freeway operational measures such as ramp metering may result in higher volumes.

In general, the implementation of ramp metering could have a 5 percent or less improvement on capacity.

9.3. Highways

For highway segments (generally uninterrupted flow highways), the maximum per-lane approach volumes as per HCM are:

- Two-lane
  - Developed: 1,700 pcphpl
  - Undeveloped: 1,700 pcphpl
- Multilane
  - Developed (55 mph free flow speed): 2,100 pcphpl
  - Undeveloped (60 mph free flow speed): 2,200 pcphpl

10 Florida's LOS Policy

REQUIREMENTS FOR LOS TARGETS FOR THE STATE HIGHWAY SYSTEM

It is FDOT's intent to plan, design, and operate the SHS at an acceptable LOS for the traveling public. The LOS targets are consistent with FDOT's Policy on Level of Service Targets for the SHS, Topic No. 000-525-006. The policy outlines the automobile mode LOS target for urbanized areas and outside urbanized areas. The automobile mode LOS targets for the SHS during peak travel hours are D in urbanized areas and C outside urbanized areas. FDOT shall work with local governments to establish appropriate LOS targets for multimodal mobility and system design. The targets shall be responsive to all users, for context, roadway function, network design, and user safety.

11 Generalized Planning Analysis

11.1. Introduction

FDOT's Generalized Service Volume Tables found at the end of this Q/LOS Handbook are the primary analysis tool in conducting this type of planning analysis. **Although considered a good generalized planning tool, the Generalized Service Volume Tables are not detailed enough for project development and environment (PD&E) traffic analysis, final design, or operational analysis work, and should not be used for those purposes.** In addition, the Generalized Service Volume Tables cannot be relied upon when approaching LOS E and LOS F thresholds, because of operational fluctuations at the thresholds. More detailed analysis should be performed in these situations.

Specific applications of the Generalized Service Volume Tables include:

- Generalized comprehensive plan amendment analyses
- Statewide highway system deficiencies and needs
- Statewide mobility performance measure reporting
- Areawide baseline capacity (e.g., MPO boundaries) and service volume values for travel demand forecasting models
- Areawide influence areas (e.g., impact areas) for major developments
- Future year analyses (e.g., SIS Needs Plans, MPO LRTPs which have a 10 to 25-year planning horizon)
- Baseline capacity and service volumes for concurrency management systems

Generalized Service Volume Tables must be appropriately applied using the right area type and facility type designations and interpreted selecting the right values from the tables. The adjustment factors must be applied, as applicable.

It is quite possible that no single roadway has the exact values for all the roadway, traffic volumes, land use, signal control, and multimodal variables used in the Generalized Service Volume Tables. The tables must be applied with care to roadway facilities and in the determination of the LOS grade.

The automobile, bicycle, and pedestrian parts of the Generalized Service Volume Tables were developed based on the definitions and methodology of the HCM. Nationally the TCQSM is the comparable document to the HCM for bus analyses.

FDOT's Generalized Service Volume Tables consist of five area types grouped into three tables:

- Urbanized areas
- Areas transitioning into urbanized/urban areas, or cities with population of more than 5,000 not in urbanized areas
- Rural undeveloped areas, or cities and developed areas with population of less than 5,000

Most planning applications begin with AADT volumes given as an input, or end with AADT as a calculated output. Therefore, the generalized daily service volumes shown in Tables 1 through 3 depict the AADT based on a standard peak hour. Some local and regional entities have adopted two-direction peak hour standards.

Tables 4 through 6 provide generalized peak hour two-way service volumes. Generalized peak hour directional volumes (Tables 7 through 9) are provided, because traffic engineering analyses are conducted on an hourly directional basis. These hourly directional tables may be viewed as the most fundamental of the tables, because the two-way tables are simply the peak hour directional values divided by D, and the daily tables are simply the peak hour directional values divided by the D and K factors.

All three sets of tables are internally consistent. All of the volumes within the tables are based on the Standard K factors. The urban/transitioning freeways are based on the average of urbanized and rural Standard K factors. The PHFs of 0.95, 0.92, and 0.88 were used in the creation of the urbanized, transitioning/urban, and rural tables, respectively. The 200th highest hour for the directional distribution variable is approximately equivalent to the typical peak hour of a day during a peak season in a developed area. Again, it is stressed that the daily, peak hour two-way, and peak hour directional tables are internally consistent and based on the same time period and directional flow of traffic.

The input values used to generate the Generalized Service Volume Tables can be found on the backs of Tables 1 through 9 and yield the results on the fronts of the Tables.

The Generalized Service Volume Tables present maximum service volumes, or the highest numbers of vehicles, for a given LOS. Any number greater than the value shown for a roadway with a given number of lanes would drop the LOS to the next letter grade.

The Generalized Service Volume Tables should not be referred to as capacity tables. In general, the values shown are the maximum service volumes for a given LOS based on roadway, traffic, control, and multimodal conditions during the peak hour in the peak travel direction. Whereas the maximum service volume deals with the highest number of vehicles for a given LOS, capacity deals with the maximum number of vehicles or persons that can pass a point during a specified time period under prevailing roadway, traffic, and control conditions. Many of the LOS E service volumes in the hourly directional tables also represent the capacity of the roadway, but in general, most of the values do not reflect a roadway's capacity.

A clear case of not representing capacity values is the daily tables. Roadway capacities for the day far exceed the volumes shown in the daily tables. All roadways are underutilized in the early morning hours and many heavily congested roads will have volumes higher than the highest volumes shown in the daily tables, because traffic is backed up for more than a one-hour time period.

Another case of not representing capacity is the arterial LOS E service volumes. **The primary criterion for the LOS on arterials is the average travel speed, not the capacity of the roadway.** The average travel speed along arterials is made of many control variables (e.g., progression, cycle length), not just the capacity (i.e., v/c ratios) of signalized intersections. Only in the special case of when the capacity of signalized intersections controls how many vehicles can pass through the intersections does capacity essentially dictate the lowest acceptable average travel speeds along arterials.

FDOT's Generalized Service Volume Tables are:

- Annual Average Daily Service Volume Tables
  - Table 1: urbanized areas
  - Table 2: transitioning into urbanized areas or urban areas

- Table 3: rural undeveloped or rural developed areas
- Peak hour two-way service volume
  - Table 4: urbanized areas
  - Table 5: transitioning into urbanized areas or urban areas
  - Table 6: rural undeveloped or rural developed areas
- Peak hour directional service volume tables
  - Table 7: urbanized areas
  - Table 8: transitioning into urbanized areas or urban areas
  - Table 9: rural undeveloped or rural developed areas

11.2. Special Cases

The volumes in the Generalized Service Volume Tables should be considered as average volumes over the facility under analysis.

For example: If a 4-mile facility has AADT counts of:

- Segment 1 - 23,000
- Segment 2 - 22,000
- Segment 3 - 25,000
- Segment 4 - 23,000 and
- Segment 5 - 27,000

FDOT recommends the use of the average value 24,000 for comparison to the tables to determine the LOS.

The use of the average volume works reasonably well, unless there is one segment that has a widely disparate value, in which case a median value may be more appropriate.

11.2.1. Mid-Block Considerations

In general, Q/LOS analyses for interrupted flow facilities primarily focus on signalized intersections. The majority of motorist aggravation is generally attributable to delay, which primarily occurs at signalized intersections on arterials. Therefore, when using the Generalized Service Volume Tables, the number of lanes for arterials and other interrupted flow facilities should be determined at major intersections rather than mid-block.

Travelers place a greater emphasis on mid-block considerations while traveling on uninterrupted flow facilities and non-automobile modes. **For example, on two-lane highways in rural undeveloped areas, the LOS is largely determined by the ability to pass other vehicles.** For freeways, most travelers are concerned about the operation of the whole facility and not the operation of particular interchanges. For bicycle and pedestrian movements, the BLOS and PLOS models are calibrated for mid-block conditions. For bus LOS, the emphasis is on the ability to travel by bus over the length of facility, with less importance placed on individual intersections. Therefore, in general, the number of lanes for these situations reflect mid-block considerations.

11.2.2. Non-State Signalized Roadways Adjustment

The primary purpose of this Q/LOS Handbook is to compute the LOS for state facilities. However, the Generalized Service Volume Tables are structured and are reasonably well-suited to local governments that desire to use them to evaluate roads under local jurisdiction. A feature of the urbanized and transitioning/urban Generalized Service Volume Tables is that Non-State roadways are addressed. The only types of roadways not addressed in the tables are unsignalized local streets and unpaved roads.

The mere fact that roadways are operated and maintained by different governmental entities has no effect on the capacity or LOS of the roadways. **However, in general, Non-State roadways have lower capacities and service volumes than state facilities, because they have lower green times at signalized intersections.** The Generalized Service Volume Tables contain a 10 percent adjustment factor for Non-State roadways.

The HCM LOS criteria address arterials rather than collectors or local streets. FDOT considers it appropriate for local governments to decide how to analyze collectors.

Uninterrupted flow facilities are analyzed the same, regardless of whether they are state facilities or not.

11.2.3. Variations in Levels of Service

Higher Q/LOS for the automobile, bicycle, and pedestrian modes may not be achieved, even with extremely low traffic volumes, given the default values used in the Generalized Service Volume Tables. In the case of automobiles, the higher Q/LOS cannot be achieved primarily because the control characteristics simply will not allow vehicles to attain relatively high average travel speeds. In the case of bicycles and pedestrians, it is primarily caused by the lack of facilities serving those modes. The tables have adequate footnotes to reflect this unachievable concept.

Lower Q/LOS for the automobile, bicycle, and pedestrian modes may not be applicable, even with extremely high traffic volumes, given the default values used in the Generalized Service Volume Tables. In the case of automobiles, the lower Q/LOS are not applicable, primarily because the control characteristics do not allow enough vehicles to pass through an intersection in an hour. If vehicles could get through the intersection, they could obtain the applicable LOS speed threshold, but there is not enough capacity at the intersection to let them pass through.

In the case of bicycles and pedestrians, it is primarily caused by the existence of facilities adequately serving those modes. For example, if a sidewalk exists, it is very difficult to establish a set of conditions in which the LOS to the pedestrian is F.

Essentially, once the maximum service volume is reached, the next LOS grade is F. For example, in Service Volume Table 1 for multilane Class I arterials, if demand volumes are greater than the LOS D threshold, then the LOS is F, and if the volume is at the LOS D threshold, the LOS is D; essentially, LOS E does not exist.

11.2.4. Median and Turn Lane Adjustment (Divided/Undivided Roadways)

For simplicity, the Generalized Service Volume Tables have factors to adjust for the effects of mid-block medians and exclusive turn lanes at intersections. The cumulative effects of medians and exclusive turn lanes from common occurrences are shown in the Generalized Service Volume Tables.

A median has the effect of changing the adjusted saturation flow rate or service volume by 5 percent. In Florida, most two-lane roadways do not have a median (e.g., a two-way left turn lane), so the tables assume no median for those facilities. However, if there is a median, appropriate service volumes should be increased 5 percent. Most multilane arterials and highways in Florida have medians, so the tables are set up to assume medians for those facilities. However, if there is no median, appropriate service volumes should be decreased 5 percent.

Most major roadways in Florida have exclusive left-turn lanes at intersections, except those with very low volumes. **If a roadway does not have left-turn lanes at major intersections, its service volume drops 20 to 25 percent, depending on the number of lanes, as indicated in the table.** The common design practice in Florida is to use shared through/right-turn lanes to accommodate right-turning vehicles. However, exclusive right-turn lanes have large capacity and service volume impacts for vehicles at major intersections.

11.2.5. One-Way Facility Adjustments

For simplicity, the urbanized and transitioning/urban area Generalized Service Volume Tables have an intuitive factor for the effects of one-way streets on vehicles. **Essentially, one-way pairs are assumed to have a 20 percent higher service volumes than corresponding two-way roadways with the same number of lanes.**

However, the Generalized Service Volume Tables treat each facility of a one-way pair separately. To account for that, the volumes in the daily and hourly two-way Tables 1 through 6 should be multiplied by 0.6, while the volumes in the hourly directional Tables 7 through 9 should be multiplied by 1.2, to obtain the correct volume and LOS.

For example, the AADT LOS D threshold for a 2-lane Class I arterial one-way facility in a transitioning area would be 9,720. This example is calculated using the Generalized Service Volume Table 2. The AADT LOS D threshold for a 2-lane Class I arterial in a transitioning area is 16,200. To calculate the LOS D threshold for a one-way facility, multiply 16,200 by the one-way facility adjustment, 0.6, to calculate the one-way facility LOS D threshold of 9,720.

11.2.6. Auxiliary Lane Adjustment

Freeway auxiliary lanes (lanes connecting on- and off-ramps) usually have significant capacity and LOS benefits. The values contained in the tables indicate their importance in a general way. To apply the values, simply add the volume shown in the freeway adjustment to the maximum service volume shown in the table.

11.2.7. Ramp Metering Adjustment

Freeway ramp metering has the benefit of smoothing out traffic demand entering a freeway during peak travel times. This benefit is reflected by increasing the service volumes shown on the tables by 5 percent.

11.2.8. Bicycle LOS (BLOS)

The bicycle portions of the Generalized Service Volume Tables make primary use of the two most important factors in determining the LOS for bicyclists: the existence of paved shoulders/bicycle lanes and vehicle volumes. **It is important to note that the volumes shown in the tables are not the number of bicyclists; rather, they are the number of vehicles in the outside lane.** Unlike automobile LOS, which is highly dependent on the number of other vehicles on the roadway, **BLOS is not determined by how many other bicyclists are on road; rather, it is primarily determined by the bicycle accommodations on the roadway and volume of vehicles.**

The other factor used in the Generalized Service Volume Tables is the volume of vehicles in the outside lane. For analysis purposes, vehicle volumes are assumed to be equally spread across the number of directional roadway lanes. Unlike the automobile entries in the table, in which the number of lanes is an entry into the tables, a step of multiplying the volume by the number of lanes is needed to use the volume (hourly directional, hourly two-way, or daily) of vehicles. For example, in Table 7, the LOS C threshold for zero percent bicycle lane coverage is 150 vehicles for the outside lane. If the roadway has four lanes, then the 150 vehicles would be multiplied by 2 (number of directional lanes) to determine the maximum volume of vehicles for BLOS C in one direction of flow. The additional step was included to simplify the appearance of the tables and save space.

11.2.9. Pedestrian LOS (PLOS)

The pedestrian portions of the Generalized Service Volume Tables make primary use of the two most important factors in determining the LOS for pedestrians: the existence of a sidewalk and vehicle volumes. It is important to note that the volumes shown in the tables are not the number of pedestrians; rather, they are the number of vehicles in the outside lane. Unlike automobile LOS, which is highly dependent on the number of other vehicles on the roadway, PLOS is not determined by how many other pedestrians use the facility; rather, it is primarily determined by the presence of sidewalks and the volume of vehicles.

The other factor used in these tables is the volume of vehicles in the outside lane. For analysis purposes, vehicle volumes are assumed to be equally spread across the number of directional roadway lanes. Unlike the automobile entries in the table, in which the number of lanes is an entry into the tables, a step of multiplying the vehicle volume by the number of lanes is needed to use the volume (hourly directional, hourly nondirectional, or daily) of vehicles. For example, in Table 7, the LOS C threshold for 100 percent sidewalk coverage is 540 vehicles for the outside lane. If the roadway has four lanes, then the 540 vehicles would be multiplied by 2 (number of directional lanes) to determine the maximum volume of vehicles for PLOS C in one direction of flow. The additional step was included to simplify the appearance of the tables and save space.

All techniques in this Q/LOS Handbook are based on a directional analysis. For example, in the case of evaluating the automobile LOS on arterials, the LOS is for the peak directional flow, and the LOS for the off-peak direction could be higher, lower, or the same. This directional technique results in some unique perspectives when evaluating PLOS. Sidewalks, whether on one or both sides of a road, serve pedestrians in both directions, unlike facilities for the other modes. Furthermore, analysts should be especially careful when using the Generalized Service Volume Tables for determining PLOS when there is a sidewalk only on one side of the roadway. Because all the Generalized Service Volume Tables are based on peak hour directional analyses, PLOS based on the tables should be considered applicable only to the direction of the peak flow of traffic. When using the tables, there is typically a difference of two LOS grades if the sidewalk is, or is not, on the same side of roadway as the peak flow of traffic. Generally, having sidewalks on both sides of arterials in developed areas is considered desirable; yet, the Generalized Service Volume Tables do not adequately reflect that concept.

11.2.10. Bus LOS

The bus portions of the Generalized Service Volume Tables are primarily dependent on bus frequency,

which is the number of scheduled fixed-route buses that have a potential to stop in a given segment in the peak direction of flow in a one-hour time period. That measure is supplemented by pedestrian accessibility. In the Generalized Service Volume Tables, pedestrian accessibility is represented by two broad ranges of sidewalk coverage.

There are two unique aspects of bus mode entries of the Generalized Service Volume Tables. First, it is important to note that the volumes shown in the tables are the number of buses per hour. Unlike automobile, bicycle, and PLOS thresholds, the bus mode LOS thresholds are not related to the number of vehicles on the roadway. Second, regardless of the table used, all numbers are shown in terms of buses per hour for the peak hour in the peak direction. Thus, even in the daily urbanized table (Table 1), the threshold values shown are still in terms of peak hour directional buses.

11.3. Service Volume Calculation Process

All service volumes and resulting tables are first calculated for the peak hour in the peak direction. The peak hour two-way values are obtained by dividing the peak hour peak direction service volumes by D. The daily volumes are obtained by dividing the peak hour two-way service volumes by K.

Peak hour directional and peak hour two-way service volumes are rounded to the nearest 10 vehicles. Daily service volumes are rounded to the nearest 100 vehicles.

11.3.1. Arterial LOS

For the automobile mode, arterial analyses starts with a volume of 10 vph and then calculates the v/c ratio at each intersection. Then, the speed on each segment is calculated, which also accounts for the signal delay and the overall average speed for the facility. The average speed is checked against the average speed criterion for LOS A. If the speed is below the LOS A threshold, the volume is incremented by either 50 vph (if the difference in the actual speed and LOS threshold speed is large) or 10 vph (if the difference in actual speed and LOS threshold speed is small). This process is repeated until the average facility speed is approximately equal to the LOS A threshold. The volume level at which this occurs is the service volume for LOS A. The volume (i.e., LOS A service volume) is then incremented by 10 vph and incrementally increased until the average facility speed is approximately equal to the LOS B threshold speed. This process repeats for LOS C, D, and E. If at any point during this process the v/c ratio exceeds 1.0 for the full hour, the calculation is stopped. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time, as well as for the lower Q/LOS grades.

For the bicycle and pedestrian modes, again the analyses is started with a volume of 10 vph and then BLOS and PLOS scores are calculated based on the BLOS and PLOS models. Then, that score is checked against the LOS A criterion. If the score is below the LOS A threshold value, the volume is incremented by 10 vph. This process is repeated until the facility score is approximately equal to the LOS A threshold. The volume level at which this occurs is then the service volume for LOS A. The volume (i.e., LOS A service volume) is then incremented by 10 vph and incrementally increased until the average facility score is approximately equal to the LOS B threshold volume. This process repeats for LOS C, D, and E. If at any point during this process the vehicle v/c ratio exceeds 1.0 for the full hour, the calculation is stopped. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time as well as for the lower Q/LOS grades.

For the bus mode, the LOS service frequency criteria that appear in the TCQSM is used, modified by PLOS, relative auto speed, bus stop amenities, and passenger load factors.

11.3.2. Freeway Facilities LOS

For freeways, the HCS7 freeway facilities module was used to obtain the service volume thresholds. The automobile volume is incrementally increased until the demand flow rate to the mean speed of the traffic stream produces an average facility density that is approximately equal to the LOS A threshold. The volume level at which this occurs is the service volume for LOS A. The volume (i.e., LOS A service volume) is then incrementally increased by 10 vph and until the average facility density is approximately equal to the LOS B threshold speed. This process repeats for LOS C, D, and E. If at any point during this process the v/c ratio exceeds 1.0 for the full hour, the calculation stops. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time, as well as for the lower Q/LOS grades. The traffic factors and other inputs such as CAF and SAF used in the analyses are discussed in the previous sections of this handbook and listed at the back of the Generalized Service Volume Tables.

11.3.3. Highways LOS

For multilane uninterrupted flow highways, HCS7's multilane highways procedure starts with a volume of 10 vph and then calculates density. If the density is below the LOS A threshold density, the volume is incremented by 10 vph. This process is repeated until the average density is approximately equal to the LOS A threshold. The volume level at which this occurs is then the service volume for LOS A. The volume (i.e., LOS A service volume) is then increased by 10 vph until the average facility density is approximately equal to the LOS B threshold density. This process repeats for LOS C, D, and E. If at any point during this process the v/c ratio exceeds 1.0 for the full hour, the calculation stops. If that condition is met, this volume becomes the service volume for whichever LOS letter grade was being evaluated at the time, as well as for the lower Q/LOS grades. The traffic factors and other inputs such as CAF and SAF used in the analyses are discussed in the previous sections of this handbook and listed at the back of the Generalized Service Volume Tables. A different free flow speed is used in the analyses for multilane uninterrupted flow highways passing through undeveloped areas and developed areas.

For two-lane uninterrupted flow highways, the computational process is similar to the process followed for multilane uninterrupted flow highways. The HCS7's two-lane highways module is dependent on the highway class (I, II, or III). The traffic factors and other inputs used in the analyses are discussed in the previous sections of this handbook and listed at the back of the Generalized Service Volume Tables. A different free flow speed is used in the analyses for two-lane uninterrupted flow highways passing through undeveloped areas and developed areas.

Glossary

Acceleration lane	A freeway lane extending from the on-ramp gore to where its taper ends.
Accessibility	The dimension of mobility that addresses the ease in which travelers can engage in desired activities.
Actuated control	All approaches to the signalized intersection have vehicle detectors, with each phase subject to a minimum and maximum green time, and some phases may be skipped if no vehicle is detected. Same as *actuated* and *fully actuated control*.
Actuated-Coordinated control	The fixed-cycle signal control of an intersection in which the through movement on the designated main roadway gets the unused green time from side movements because of limited or no vehicle activation from side movements. Same as *coordinated-actuated*.
Add-on/drop-off lanes	The roadway lanes added before an intersection and dropped after the intersection. Same as *expanded intersections*.
Adjusted saturation flow rate	In this Q/LOS Handbook, the base saturation flow rate times the effect of many roadway variables and traffic variables.
Adjustment factor	In the Generalized Service Volume Tables: additive or multiplicative factors to adjust service volumes.
All-way stop control	An intersection with a stop sign at all approaches.
Annual average daily traffic	The volume passing a point or segment of a roadway in both directions for one year, divided by the number of days in the year.
Areawide analysis	An evaluation within a geographic boundary.
Arrival type	A general categorization of the quality of signal progression.
Arterial	A signalized roadway that primarily serves through traffic with average signalized intersection spacing of 2 miles or less; a type of roadway based on FDOT's functional classification.
Auxiliary lane	An additional lane on a freeway connecting an on-ramp of one interchange to the off-ramp of the downstream interchange.
Average daily traffic	The total traffic volume during a given time period (more than a day and less than a year) divided by the number of days in that time period.
Average travel speed	The facility length divided by the average travel time of all vehicles traversing the facility, including all stopped delay times.
Axle correction factors	The adjustment factors used to calculate the annual average daily traffic by compensating for an axle counter's tendency to count more vehicles than are present.
Base conditions	The best possible characteristic in terms of capacity for a given type of facility.

Base saturation flow rate	The maximum steady flow rate, expressed in passenger cars per hour per lane, at which passenger cars can cross a point on interrupted flow roadways.
Basic segment	In this Q/LOS Handbook, the length of a freeway in which operations are unaffected by interchanges. Same as *basic freeway segment*.
Basic two-lane highway Segments	A highway segment upstream of the intersection influence area and downstream of the affected downstream highway segment, and thus not affected by signalized intersections.
Bicycle lane	In this Q/LOS Handbook, a designated or undesignated portion of roadway for bicycles adjacent to vehicle lanes.
Bicycle level of service score	A numerical value calculated by the BLOS Model that corresponds to a BLOS.
Bus frequency	The number of buses per hour serving one direction of a roadway facility.
Bus stop	An area where bus passengers wait for, board, alight, and transfer.
Bus stop amenities	Enhancements for comfort or safety that can greatly influence the perceived QOS along a route. Four categories of bus stop amenities exist: excellent, good, fair, and poor.
Bus stop amenity factors	Factors used to determine the adjusted bus frequency value by applying a factor commensurate to the quality of bus stop amenities.
Bus stop type adjustment factors	Factors that adjust travel times along bus routes by adding 15 to 35 seconds of delay per route for typical and major bus stops, respectively.
Capacity	The maximum sustainable flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of roadway during a given time period under prevailing conditions. As typically used in this Q/LOS Handbook, the maximum number of vehicles that can pass a point in one hour under prevailing roadway, traffic and control conditions.
Capacity adjustment factor	An adjustment factor used in the HCS7 freeways and multilane highways module to adjust the capacity of a facility for reduced capacity situations or to match field measurements. The capacity can be reduced to represent incident situations, such as construction and maintenance activities, adverse weather, traffic incidents, and vehicle breakdowns.
Capacity constrained	A condition in which traffic *demand* exceeds the capacity of a roadway.
Capacity utilization	The dimension of mobility that addresses the quantity of operations relative to capacity.
Captive rider	A transit rider who is limited by circumstances to use transit as a primary source of transportation.
Choice rider	A transit rider who chooses to take transit over other readily available transportation options.
Class I arterial	A roadway that has posted speeds of 40 mph or higher.

Class II arterial	A roadway that has posted speeds of 35 mph or less.
Collector	A roadway providing land access and traffic circulation with residential, commercial and industrial areas.
Concurrency	A systematic process utilized by local governments to ensure new development does not occur unless adequate infrastructure is in place to support growth.
Context classification	A classification assigned to a roadway that broadly identifies the various built environments in Florida, based on existing or future land use characteristics, development patterns, and the roadway connectivity of an area.
Control delay	The component of delay that results when a signal causes traffic to reduce speed or stop.
Control variables	The parameters associated with roadway controls.
Core freeways	The major, non-toll freeways going through the urbanized core areas of the largest metropolitan areas, such as Interstate 4 in Orlando. FDOT has adopted lower K values for these freeways to represent a peak period, as opposed to a peak hour analysis. The lower K values affect daily service volumes only in the Generalized Service Volume Tables.
Critical signalized intersection	The signalized intersection with the lowest volume-to-capacity ratio (v/c), typically the one with the lowest effective green ratio (g/C) for the through movement. Same as *critical signalized intersection*.
Cycle length	The time it takes a traffic signal to go through one complete sequence of signal indications.
Deceleration lane	A freeway lane extending from the taper to the off-ramp gore.
Delay	The additional travel time experienced by a traveler.
Demand	The number of persons or vehicles desiring service on a roadway. Same as *demand traffic*.
Density	The number of vehicles, averaged over time, occupying a given length of lane or roadway; usually expressed as vehicles per mile or vehicles per mile per lane.
Developed areas	All areas not rural undeveloped. Same as rural developed areas.
Directional distribution factor	The proportion of an hour's total volume occurring in the higher volume direction.
Effective green ratio	Typically in this Q/LOS Handbook, the ratio of the effective green time (g) for the through movement at a signal intersection to its cycle length (C).
Effective green time	The time allocated for the through movement to proceed; calculated as the through movement green plus yellow plus all-red indication times less the lost time.
Exclusive left-turn storage length	The total amount of storage length, in feet, for exclusive left-turn lanes.
Exclusive right-turn lanes	A storage area designated to only accommodate right-turning vehicles.

Exclusive turn lane	A storage area designated to only accommodate left- or right-turning vehicles; in this Q/LOS Handbook, the turn lane must be long enough to accommodate enough turning vehicles to allow the free flow of the through movement.
Five-lane section	A roadway with four through lanes, two in each direction, separated by a two-way left turn lane; in the Generalized Service Volume Tables, a five-lane section is treated as a roadway with four lanes and a median.
Flow rate	In this Q/LOS Handbook, the equivalent hourly rate at which vehicles pass a point on a roadway for a 15-minute period.
Free flow speed	In this Q/LOS Handbook, the average speed of vehicles under low-flow traffic conditions and not under the influence of signals, stop signs, or other fixed causes of interruption, generally assumed to be 5 mph over the posted speed limit.
Freeway	A multilane, divided highway with at least two lanes for the exclusive use of traffic in each direction and full control of ingress and egress.
Freeway segment	In this Q/LOS Handbook, a basic segment, interchange or toll plaza.
FSUTMS	Florida Standard Urban Transportation Model Structure; Florida's software that forecasts travel demand.
Functional classification	The assignment of roads into systems according to the character of service they provide in relation to the total road network.
Generalized Service Volume Tables	Maximum service volumes based on areawide roadway, traffic, and control variables and presented in tabular form.
Generalized planning	A broad type of planning application that includes statewide analyses, initial problem identification, and future year analyses. In this Q/LOS Handbook, typically performed by using the Generalized Service Volume Tables.
Gore	The point located immediately between the left edge of a ramp pavement and the right edge of the roadway pavement at a merge or diverge area.
Headway	The time, in seconds, between two successive vehicles as they pass a point on a roadway.
Heavy vehicle	An FHWA vehicle classification of 4 or higher; essentially, vehicles with more than 4 wheels touching the pavement during normal operation.
Heavy vehicle factor	The adjustment factor for heavy vehicles.
Heavy vehicle percent	The percentage of heavy vehicles in the traffic stream.
Highway capacity analysis	An examination of the maximum of vehicles or persons that can reasonably be expected to pass a point on a roadway during a specified time period under prevailing roadway, traffic, and control conditions. Same as *capacity analysis*.
Highway Capacity Manual	The Transportation Research Board's document on highway capacity and QOS.
Highway Capacity Software 7	Software that replicates the HCM, Sixth Edition.

Interchange	In this Q/LOS Handbook, the influence area associated with the off-ramp influence area, overpass/underpass, and on-ramp influence area of a connection to a freeway. Same as *freeway interchange influence area*.
Interrupted flow	A category of roadways characterized by signals, stop signs, or other fixed causes of periodic delay or interruption to the traffic stream, with average spacing less than or equal to 2.0 miles.
Intersection influence area	In this Q/LOS Handbook, a segment of an uninterrupted flow highway influenced by an isolated intersection.
Interval	A period of time in which all traffic signal indications remain constant.
Isolated intersection	An intersection occurring along an uninterrupted flow highway.
Large urbanized area	A Metropolitan Planning Organization urbanized area greater than 1 million in population; in Florida, these seven areas consist of the following central cities: Fort Lauderdale, Jacksonville, Miami, Orlando, St. Petersburg, Tampa, and West Palm Beach.
Lateral clearance	Clearance distance from edges of outside lanes to fixed obstructions.
Level of service	A quantitative stratification of the QOS to a typical traveler of a service or facility into six letter-grade levels, with A describing the highest quality and F describing the lowest quality; a discrete stratification of a QOS continuum.
Level of service targets	The same as the statewide minimum LOS targets for the State Highway System.
Load factor	The ratio of passengers actually carried to the total passenger capacity of a bus.
Local adjustment factor	In the 2013 Q/LOS Handbook, an adjustment factor FDOT used to adjust base saturation flow rates or base capacities to better match actual Florida traffic volumes; mostly consisted of a driver population factor and an area type factor.
Maximum service volume	The highest number of vehicles for a given LOS.
Median	In this Q/LOS Handbook, areas at least 10 feet wide that are restrictive or non-restrictive, which separate opposing-direction mid-block traffic lanes and, on arterials, contain turn lanes that allow left-turning vehicles to exit from the through traffic lanes.
Median type	A classification of roadway medians as restrictive, non-restrictive, or no median.
Mid-block	In this Q/LOS Handbook, the part of a roadway between two signalized intersections.
Mobility	The movement of people and goods.
Mode	A method of travel; in this Q/LOS Handbook, either automobile, bus, bicycle, or pedestrian.
Motorized mode	A method of travel by automobile or bus.

MPO/TPO	Metropolitan/Transportation Planning Organization.
Multilane highway	A nonfreeway roadway with two or more lanes in each direction and, although occasional interruptions to flow at signalized intersections may exist, is generally uninterrupted flow.
Multimodal	In this Q/LOS Handbook, more than one mode.
Multimodal Transportation District	An area in which secondary priority is given to vehicle mobility, and primary priority is given to ensuring a safe, comfortable, and attractive pedestrian environment, with convenient interconnection to transit (F.S. 163.3180[15]).
No passing zone	In this Q/LOS Handbook, a segment of a two-lane highway along which passing is prohibited in the analysis direction.
Non-restrictive median	A painted, at-grade area separating opposing mid-block traffic lanes.
Non-State signalized roadway	A signalized roadway not on the State Highway System.
Number of effective lanes	In terms of capacity, the equivalent number of through lanes. Typically, the number is expressed as a fraction (e.g., 2.7) to reflect the partial beneficial effects of freeway auxiliary lanes or arterial add-on/drop-off lanes.
Number of through lanes	The number of lanes relevant to an analysis of a roadway's LOS. FOR ARTERIALS ▪ Usually at the signalized intersection, not mid-block ▪ Usually through and shared right-turn lanes ▪ Maybe a fractional number reflecting add-on/drop-off lanes or other special lane utilization considerations ▪ Using the Generalized Service Volume Tables, the number at major signalized intersections FOR FREEWAYS AND UNINTERRUPTED FLOW HIGHWAYS ▪ Does not include auxiliary lanes between two points ▪ Usually the predominant number of through lanes between two points
Off-ramp influence area	The geographic limits affecting the capacity of a freeway associated with traffic exiting a freeway. Same as *diverge area*.
On-ramp influence area	The geographic limits affecting the capacity of a freeway associated with traffic entering a freeway. Same as *merge area*.
One-way	A type of roadway in which vehicles are allowed to move in only one direction.
Operational analysis	A detailed analysis of a roadway's present or future LOS, as opposed to a generalized planning.
Other urbanized area	A Metropolitan Planning Organization urbanized area with less than 1 million in population.
Oversaturated	A traffic condition in which demand exceeds capacity.
Passenger load factors	Factors used to determine the adjusted bus frequency value by applying a factor commensurate to the level of passenger crowding.

Passing lane	A lane added to provide passing opportunities in one direction of travel on a two-lane highway. Two-way left-turn lanes are not considered passing lanes.
Paved shoulder/bicycle lane	In this Q/LOS Handbook, pavement at least 3 feet in width separated by a solid pavement marking from the outside vehicle through lane to the edge of the pavement.
Peak direction	The course of the higher flow of traffic.
Peak hour	In this Q/LOS Handbook, a one-hour time period with high volume.
Peak hour factor	The ratio of the hourly volume to the peak 15-minute flow rate for that hour; specifically, hourly volume/(4 x peak 15-minute volume).
Peak period	A multi-hour analysis period with high volume; peak periods rather than peak hours are typically used for the analysis of core freeways or roadways within a Multimodal Transportation District.
Peak season	The 13 consecutive weeks with the highest daily volumes for an area.
Peak season weekday average daily traffic	The average daily traffic for Monday through Friday during the peak season.
Pedestrian	An individual traveling on foot and other non-motorized modes such as skateboards, scooters and both motorized and non-motorized wheelchairs.
Pedestrian accessibility	In this Q/LOS Handbook, the ease in which a pedestrian can reach a bus stop.
Pedestrian LOS Model	The operational methodology from which this Q/LOS Handbook's pedestrian Q/LOS analyses are based.
Pedestrian level of service score	A numerical value calculated by the PLOS Model that corresponds to a PLOS.
Pedestrian/sidewalk/roadway separation	The lateral distance, in feet, from the outer edge of the pavement to where a pedestrian walks on a sidewalk.
Percent time spent following	The average percent of total travel time that vehicles must travel in platoons behind slower vehicles because of the inability to pass on a two-lane highway.
Performance measure	A qualitative or quantitative factor used to evaluate a particular aspect of travel quality.
Person flow	The capacity on uninterrupted and interrupted flow facilities, defined in terms of persons per hour.
Phase	The part of a traffic signal's cycle allocated to any combination of traffic movements receiving the right of way simultaneously during one or more intervals.
Planning analysis hour factor	The ratio of the traffic volume in the study hour to the annual average daily traffic.
Planning horizon	A time period, typically 20 years, applicable to the analysis of a project, roadway or service.
Platoon	A group of vehicles traveling together as a group, either voluntarily or

	involuntarily because of signal control, geometrics, or other factors.
Point	A boundary between links. In this Q/LOS Handbook, usually a signalized intersection, but maybe other places where modal users enter, leave, or cross a facility, or roadway characteristics change.
Posted speed	The maximum speed at which vehicles are legally allowed to travel over a roadway segment.
Pretimed control	Traffic signal control in which the cycle length, phase plan, and phase times are preset and repeated continuously, according to a preset plan.
Prevailing conditions	Existing circumstances that primarily include roadway, traffic, and control conditions, but may also include weather, construction, incidents, lighting, and area type.
Principal arterial	A signalized roadway that primarily serves through traffic between centers of metropolitan areas and provides a high degree of mobility. In this Q/LOS Handbook, principal arterials have approximately one signal every half mile and a posted speed limit of 50 mph.
Quality of service	A traveler-based perception of how well a service or facility is operating.
Quality/level of service	A combination of the broad QOS and more detailed LOS concepts.
Queue spillback	When a link's queue of vehicles extends to upstream links.
Ramp overlap segment	The length for which the upstream on-ramp influence area and the downstream off-ramp influence area overlap.
Restrictive median	A raised or grassed area that restricts crossing movements.
Roadway	A general categorization of an open way for persons and vehicles to traverse; in this Q/LOS Handbook, it encompasses streets, arterials, freeways, highways, and other facilities.
Roadway class	The categories of two-lane highways; two-lane highways are primarily grouped by area type. Same as *class*.
Roadway variables	The parameters associated with roadways. Also known as *roadway characteristics*.
Rolling terrain	A combination of horizontal and vertical alignments causing heavy vehicles to reduce their running speeds substantially below that of passenger cars, but not to operate at crawl speeds for a significant amount of time.
Route	As used in the TCQSM, a designated, specified path to which a bus is assigned.
Route segment	As used in the TCQSM, a portion of a bus route ranging from two stops to the entire length of the route.
Running speed	The distance a vehicle travels divided by the travel time the vehicle is in motion.
Rural area	In the Generalized Service Volume Tables, areas that are not

	urbanized areas, transitioning areas, or urban areas.
Rural developed areas	The portions of rural areas that are along coastal roadways or in generally populated areas with a population of less than 5,000.
Rural undeveloped areas	Portions of rural areas with no or minimal population or development.
Scheduled fixed route	In this Q/LOS Handbook, bus service provided on a repetitive, fixed-schedule basis along a specific route, with buses stopping to pick up and deliver passengers to specific locations.
Seasonal adjustment factor	A factor used to adjust for the variation in traffic over the course of a year.
Section	A group of consecutive segments that have similar roadway characteristics, traffic characteristics and, as appropriate, control characteristics for a mode of travel. A characteristic describing laneage (e.g., three-lane section, five-lane section, seven-lane section).
Segment	A portion of a facility defined by two boundary points; usually the length of roadway from one signalized intersection to the next signalized intersection.
Service measure	A specific performance measure used to assign a LOS to a set of operating conditions for a transportation facility or service.
Service volume table	Maximum service volumes based on roadway, traffic and control variables and presented in tabular form.
Seven-lane section	A roadway with six through lanes, three in each direction separated by a two-way left-turn lane; in the Generalized Service Volume Tables, a seven-lane section is treated as a roadway with six lanes and a median.
Shared lane	A roadway lane shared by two or three traffic movements; in Florida, a shared lane usually serves through and right-turning traffic movements.
Sidewalk	A paved walkway for pedestrians at the side of a roadway.
Sidewalk/roadway protective barrier	Physical barriers separating pedestrians on sidewalks and vehicles.
Sidewalk/roadway separation	The lateral distance in feet from the outside edge of the pavement to the inside edge of the sidewalk.
Signal	In this Q/LOS Handbook, a traffic control device regulating the flow of traffic with green, yellow, and red indications. A traffic control device that routinely stops vehicles during the study period; excluded from this definition are flashing yellow lights, railroad crossings, draw bridges, yield signs, and other control devices.
Signal density	The number of signals intersections per mile.
Signal type	The kind of traffic signal (actuated, pretimed or coordinated-actuated) with respect to the way its cycle length, phase plan, and phase times are operated.

Signalized intersection	A place where two roadways cross and have a signal controlling traffic movements.
Signalized intersection spacing	The distance between signalized intersections.
Simple average	An average that gives equal weight to each component.
Speed	In this Q/LOS Handbook, the same as average travel speed, unless specifically noted.
Speed adjustment factor	An adjustment factor in HCS 7's freeways and multilane highways module, used to adjust the speed of a facility to account for the effects of adverse weather and construction work zones. The SAF also may be used to calibrate estimates of free-flow speed for local conditions or other effects that contribute to a reduction in free-flow speed.
Standard K	FDOT's standard peak hour to annual average daily traffic ratio (K), based on a roadway's characteristics (facility type) and location (area type). Values of less than 9 percent essentially represent a multi-hour peak period rather than a peak hour.
State Highway System	All roadways that FDOT operates and maintains; the State Highway System consists of the Florida Intrastate Highway System and other state roads.
Stochastic	A description of a type of model that incorporates variability and uncertainty into analysis.
Strategic Intermodal System	Florida's system of transportation facilities and services of statewide and interregional significance.
Termini	In this Q/LOS Handbook, the beginning and endpoints of a facility.
Three-lane section	A roadway with two through lanes separated by a two-way left-turn lane. In the Generalized Service Volume Tables, a three-lane section is treated as a roadway with two lanes and a median. An exclusive passing lane on a two-lane highway is not considered a three-lane section.
Threshold	The breakpoints between LOS differentiations.
Threshold delay	The additional travel time represented by the difference between the time associated with a roadway's generally accepted speed (LOS D threshold in urbanized areas and LOS C threshold in nonurbanized areas) and average travel speed. Same as LOS threshold delay.
Through movement	In this Q/LOS Handbook, the traffic stream with the greatest number of vehicles passing directly through a point. Typically, this is the straight-ahead movement, but occasionally it may be a turning movement.
Traffic demand	The number of vehicles with drivers who desire to traverse a particular highway during a specified time period.
Traffic volume	The number of vehicles passing a point on a highway during a specified time period.
Transit	In this Q/LOS Handbook, the same as *bus*.

Transit Capacity and Quality of Service Manual (TCQSM)	The document and operational methodology from which this Q/LOS Handbook's bus Q/LOS analyses are based.
Transitioning area	An area adjacent to an urbanized area that exhibits characteristics between rural and urbanized/urban, and will be urbanized in the next 20 years.
Transportation planning boundaries	Precisely defined lines that delineate geographic areas. These boundaries are used throughout transportation planning in Florida. Their mapping is described in Urban Boundaries and Functional Classification of Roadways FDOT's Procedure Topic No. 525-020-311.
Travel time	The average time spent by vehicles traversing a roadway.
Two-lane highway	A roadway with one lane in each direction on which passing maneuvers must be made in the opposing lane and, although occasional interruptions to flow at signalized intersections may exist, is generally uninterrupted flow.
Two-way	Movement allowed in either direction.
Two-way left-turn lane	A lane that simultaneously serves left-turning vehicles traveling in opposite directions. Same as continuous left-turn lane.
Two-way stop control	The type of traffic control at an intersection where drivers on the minor street, or a driver turning left from the major street, wait for a gap in major-street traffic to complete a maneuver.
Undesignated bicycle lane	A lane, usually 4 feet in width, that does not contain a bicycle logo.
Undivided	As used in the Generalized Service Volume Tables, a roadway with no median.
Uninterrupted flow	A category of roadway not characterized by signals, stop signs, or other fixed causes of periodic delay or interruption to traffic stream.
Uninterrupted flow highway	A nonfreeway roadway that generally has uninterrupted flow, with average signalized intersection spacing of greater than 2.0 miles; a two-lane highway or a multilane highway.
Urban area	A place with a population between 5,000 and 50,000 and not in an urbanized area. The applicable boundary includes the census' urban area and the surrounding geographical area agreed on by the FDOT, the local government, and the FHWA. The boundaries are commonly called FHWA Urban Area Boundaries and include areas expected to develop medium density before the next decennial census.

Urbanized area	An area within a Metropolitan Planning Organization's (MPO) designated urbanized area boundary. The minimum population for an urbanized area is 50,000 people. Based on the census, any area the U.S. Bureau of Census designates as urbanized, together with any surrounding geographical area agreed on by the FDOT, the relevant MPO, and the FHWA, commonly called the FHWA Urbanized Area Boundary.
Volume-to-capacity ratio	The ratio of demand flow rate to capacity of a signalized intersection, segment or facility.
Weaving distance	A length of freeway over which traffic streams across paths through lane-changing maneuvers. Same as *weaving segment*.
Weighted effective green ratio	In this Q/LOS Handbook, the average of the critical intersection's through effective green ratio and the average of all the other signalized intersections' through effective green ratios along the arterial facility.

TABLE 1

Generalized **Annual Average Daily** Volumes for Florida's Urbanized Areas

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	16,800	17,700	**
4	Divided	*	37,900	39,800	**
6	Divided	*	58,400	59,900	**
8	Divided	*	78,800	80,100	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	7,300	14,800	15,600
4	Divided	*	14,500	32,400	33,800
6	Divided	*	23,300	50,000	50,900
8	Divided	*	32,000	67,300	68,100

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,900	7,600	19,700
50-84%	2,100	6,700	19,700	>19,700
85-100%	9,300	19,700	>19,700	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,500
50-84%	*	1,600	8,700	15,800
85-100%	3,800	10,700	17,400	>19,700

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Core Urbanized

Lanes	B	C	D	E
4	47,600	66,400	83,200	87,300
6	70,100	97,800	123,600	131,200
8	92,200	128,900	164,200	174,700
10	115,300	158,900	203,600	218,600
12	136,500	192,400	246,200	272,900

Urbanized

Lanes	B	C	D	E
4	45,900	62,700	75,600	85,400
6	68,900	93,900	113,600	128,100
8	91,900	125,200	151,300	170,900
10	115,000	156,800	189,300	213,600

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 20,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	11,700	18,000	24,200	32,600
4	Divided	36,300	52,600	66,200	75,300
6	Divided	54,600	78,800	99,400	113,100

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 1
(continued)

Generalized **Annual Average Daily** Volumes for Florida's Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities				Interrupted Flow Facilities					
					State Arterials				Class I	
	Freeways	Core Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	urban	urban								
Number of through lanes (both dir.)	4-10	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	65	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	70	55	55	50	55	35	35	50	50
Auxiliary Lanes (n,y)	n	n								
Median (d, twlt, n, nr, r)				d	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone			80							
Exclusive left turn lane impact (n, y)			[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)					n	n	n	n	n	n
Facility length (mi)	3	3	5	5	2	2	1.9	1.8	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.090	0.085	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	0.95	0.95	0.95	0.95	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Speed Adjustment Factor (SAF)	0.975	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968	0.968		0.968						
% left turns					12	12	12	12	12	12
% right turns					12	12	12	12	12	12
CONTROL CHARACTERISTICS										
Number of signals					4	4	10	10	4	6
Arrival type (1-6)					3	3	4	4	4	4
Signal type (a, c, p)					c	c	c	c	c	c
Cycle length (C)					120	150	120	120	120	120
Effective green ratio (g/C)					0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)									n, 50%, y	n
Outside lane width (n, t, w)									t	t
Pavement condition (d, t, u)									t	
On-street parking (n, y)										
Sidewalk (n, y)										n, 50%, y
Sidewalk/roadway separation(a, t, w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
		Two-Lane	Multilane	Class I	Class II			
	Density	%ffs	Density	ats	ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

TABLE 2

Generalized **Annual Average Daily** Volumes for Florida's Transitioning Areas **and** Areas Over 5,000 Not In Urbanized Areas[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	14,400	16,200	**
4	Divided	*	34,000	35,500	**
6	Divided	*	52,100	53,500	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	6,500	13,300	14,200
4	Divided	*	9,900	28,800	31,600
6	Divided	*	16,000	44,900	47,600

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,600	6,100	19,500
50-84%	1,900	5,500	18,400	>19,500
85-100%	7,500	19,500	>19,500	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,800	9,400
50-84%	*	1,600	8,600	15,600
85-100%	3,800	10,500	17,100	>19,500

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	45,100	59,000	70,300	72,600
6	65,300	86,600	104,100	108,900
8	85,900	114,500	138,100	145,300
10	101,600	135,600	161,900	181,800

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 20,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	11,300	17,300	23,400	31,600
4	Divided	34,600	49,900	63,000	71,700
6	Divided	51,700	74,800	94,600	107,400

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable le for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 2
(continued)

Generalized **Annual Average Daily** Volumes for Florida's Transitioning Areas **and** Areas Over 5,000 Not In Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (urban, rural)	urban								
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (d, n, nr, r)			d	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	6	5	5	1.8	2	2	2	2	2
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.098	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	0.92	0.92	0.92	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Speed Adjustment Factor (SAF)	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968		0.968						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
		Two-Lane	Multilane	Class I	Class II			
	Density	%ffs	Density	ats	ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

TABLE 3

Generalized **Annual Average Daily** Volumes for Florida's Rural Undeveloped Areas **and** Developed Areas Less Than 5,000 Population[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
2	Undivided	*	12,900	14,200	**
4	Divided	*	29,300	30,400	**
6	Divided	*	45,200	45,800	**

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	1,300	2,000	3,200
50-84%	1,000	2,100	3,200	10,600
85-100%	2,600	3,900	18,500	>18,500

Developed Areas

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	2,300	4,900	15,600
50-84%	1,700	4,500	13,300	18,500
85-100%	5,900	18,500	>18,500	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	2,700	9,200
50-84%	*	1,500	8,400	14,900
85-100%	3,600	10,200	16,700	>19,200

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	34,800	48,000	56,700	63,200
6	48,900	69,000	82,600	94,800
8	62,900	90,400	108,400	126,400

Freeway Adjustments

Auxiliary Lanes Present in Both Directions

+ 20,000

UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped

Lanes	Median	B	C	D	E
2	Undivided	4,600	8,600	14,000	28,500
4	Divided	31,200	44,900	55,700	62,700
6	Divided	46,800	67,600	83,500	94,200

Developed Areas

Lanes	Median	B	C	D	E
2	Undivided	10,300	15,700	21,300	28,500
4	Divided	29,300	42,300	54,000	61,600
6	Divided	44,000	63,600	81,200	92,400

Passing Lane Adjustments

Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as two-way annual average daily volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 3
(continued)

Generalized **Annual Average Daily** Volumes for Florida's Rural Undeveloped Areas **and** Developed Areas Less Than 5,000 Population

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways Undeveloped		Highways Developed		Arterials		Bicycle		Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	rural									
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	55	50	50	45	45	55	45	45
Free flow speed (mph)	75	60	60	55	55	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (d, n, nr, r)			d		d	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	18	10	10	5	5	1.9	2.2	4	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	0.88	0.88	0.88	0.88	0.88	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	5.0	8.0	3.0	3.0	6.0	3.5	3.0
Speed Adjustment Factor (SAF)	0.975		0.975		0.975					
Capacity Adjustment Factor (CAF)	0.968		0.968		0.968					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd
	Density	%tsf	ats	%ffs	Density	Density
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34

Level of Service	Arterials	Bicycle	Pedestrian
	Major City/Co.(ats)	Score	Score
B	> 31 mph	≤ 2.75	≤ 2.75
C	> 23 mph	≤ 3.50	≤ 3.50
D	> 18 mph	≤ 4.25	≤ 4.25
E	> 15 mph	≤ 5.00	≤ 5.00

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

TABLE 4

Generalized **Peak Hour Two-Way** Volumes for Florida's Urbanized Areas[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	1,510	1,600	**
4	Divided	*	3,420	3,580	**
6	Divided	*	5,250	5,390	**
8	Divided	*	7,090	7,210	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	660	1,330	1,410
4	Divided	*	1,310	2,920	3,040
6	Divided	*	2,090	4,500	4,590
8	Divided	*	2,880	6,060	6,130

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	260	680	1,770
50-84%	190	600	1,770	>1,770
85-100%	830	1,700	>1,770	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	250	850
50-84%	*	150	780	1,420
85-100%	340	960	1,560	>1,770

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Core Urbanized

Lanes	B	C	D	E
4	4,050	5,640	6,800	7,420
6	5,960	8,310	10,220	11,150
8	7,840	10,960	13,620	14,850
10	9,800	13,510	17,040	18,580
12	11,600	16,350	20,930	23,200

Urbanized

Lanes	B	C	D	E
4	4,130	5,640	7,070	7,690
6	6,200	8,450	10,510	11,530
8	8,270	11,270	13,960	15,380
10	10,350	14,110	17,310	19,220

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	1,050	1,620	2,180	2,930
4	Divided	3,270	4,730	5,960	6,780
6	Divided	4,910	7,090	8,950	10,180

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 4 (continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities				Interrupted Flow Facilities					
					State Arterials				Class I	
	Freeways	Core Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	urban	urban								
Number of through lanes (both dir.)	4-10	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	65	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	70	55	55	50	55	35	35	50	50
Auxiliary Lanes (n,y)	n	n								
Median (d, twlt, n, nr, r)				d	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone			80							
Exclusive left turn lane impact (n, y)			[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)					n	n	n	n	n	n
Facility length (mi)	3	3	5	5	2	2	1.9	1.8	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.090	0.085	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	0.95	0.95	0.95	0.95	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Speed Adjustment Factor (SAF)	0.975	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968	0.968		0.968						
% left turns					12	12	12	12	12	12
% right turns					12	12	12	12	12	12
CONTROL CHARACTERISTICS										
Number of signals					4	4	10	10	4	6
Arrival type (1-6)					3	3	4	4	4	4
Signal type (a, c, p)					c	c	c	c	c	c
Cycle length (C)					120	150	120	120	120	120
Effective green ratio (g/C)					0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)									n, 50%, y	n
Outside lane width (n, t, w)									t	t
Pavement condition (d, t, u)									t	
On-street parking (n, y)										
Sidewalk (n, y)										n, 50%, y
Sidewalk/roadway separation(a, t, w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
		Two-Lane	Multilane	Class I	Class II			
	Density	%ffs	Density	ats	ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

TABLE 5

Generalized **Peak Hour Two-Way** Volumes for Florida's Transitioning Areas **and** Areas Over 5,000 Not In Urbanized Areas[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	1,300	1,460	**
4	Divided	*	3,060	3,200	**
6	Divided	*	4,690	4,820	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
2	Undivided	*	580	1,200	1,280
4	Divided	*	890	2,590	2,850
6	Divided	*	1,440	4,040	4,280

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	140	550	1,760
50-84%	170	500	1,650	>1,760
85-100%	670	1,760	>1,760	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	250	850
50-84%	*	150	780	1,410
85-100%	340	950	1,540	>1,760

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	4,420	5,780	6,890	7,110
6	6,400	8,490	10,200	10,670
8	8,420	11,220	13,530	14,240
10	9,960	13,290	15,870	17,820

Freeway Adjustments

Auxiliary Lanes Present in Both Directions	Ramp Metering
+ 1,800	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
2	Undivided	1,020	1,560	2,110	2,840
4	Divided	3,110	4,490	5,670	6,450
6	Divided	4,650	6,730	8,510	9,670

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 5
(continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's Transitioning Areas **and** Areas Over 5,000 Not In Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (urban, rural)	urban								
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (d, n, nr, r)			d	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	6	5	5	1.8	2	2	2	2	2
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.098	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	0.92	0.92	0.92	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Speed Adjustment Factor (SAF)	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968		0.968						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
		Two-Lane	Multilane	Class I	Class II			
	Density	%ffs	Density	ats	ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

TABLE 6

Generalized **Peak Hour Two-Way** Volumes for Florida's Rural Undeveloped Areas **and** Developed Areas Less Than 5,000 Population[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
2	Undivided	*	1,220	1,350	**
4	Divided	*	2,790	2,890	**
6	Divided	*	4,300	4,350	**

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
2	Divided	Yes	No	+5%
2	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding two-directional volumes in this table by 0.6

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	120	190	300
50-84%	100	200	310	1,010
85-100%	250	370	1,760	>1,760

Developed Areas

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	220	460	1,480
50-84%	170	430	1,270	>1,760
85-100%	560	1,760	>1,760	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	220	840
50-84%	*	120	780	1,390
85-100%	320	940	1,560	>1,820

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
4	3,650	5,040	5,950	6,640
6	5,130	7,250	8,670	9,950
8	6,600	9,490	11,380	13,270

Freeway Adjustments

Auxiliary Lanes
Present in Both Directions
+ 1,800

UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped

Lanes	Median	B	C	D	E
2	Undivided	440	820	1,330	2,710
4	Divided	2,960	4,270	5,290	5,960
6	Divided	4,450	6,420	7,930	8,950

Developed Areas

Lanes	Median	B	C	D	E
2	Undivided	980	1,490	2,020	2,710
4	Divided	2,780	4,020	5,130	5,850
6	Divided	4,180	6,040	7,710	8,780

Passing Lane Adjustments

Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
2	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1] Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 6 (continued)

Generalized **Peak Hour Two-Way** Volumes for Florida's Rural Undeveloped Areas **and** Developed Areas Less Than 5,000 Population

January 2020

INPUT VALUE ASSUMPTIONS	**Uninterrupted Flow Facilities**					**Interrupted Flow Facilities**				
	Freeways	Highways				Arterials		Bicycle		Pedestrian
		Undeveloped		Developed						
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	rural									
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	55	50	50	45	45	55	45	45
Free flow speed (mph)	75	60	60	55	55	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (d, n, nr, r)			d		d	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	18	10	10	5	5	1.9	2.2	4	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	0.88	0.88	0.88	0.88	0.88	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	5.0	8.0	3.0	3.0	6.0	3.5	3.0
Speed Adjustment Factor (SAF)	0.975		0.975		0.975					
Capacity Adjustment Factor (CAF)	0.968		0.968		0.968					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	**Freeways**	**Highways**				
		Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd
	Density	%tsf	ats	%ffs	Density	Density
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34

Level of Service	**Arterials**	**Bicycle**	**Pedestrian**
	Major City/Co.(ats)	Score	Score
B	> 31 mph	≤ 2.75	≤ 2.75
C	> 23 mph	≤ 3.50	≤ 3.50
D	> 18 mph	≤ 4.25	≤ 4.25
E	> 15 mph	≤ 5.00	≤ 5.00

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed

TABLE 7

Generalized **Peak Hour Directional** Volumes for Florida's Urbanized Areas

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	830	880	**
2	Divided	*	1,910	2,000	**
3	Divided	*	2,940	3,020	**
4	Divided	*	3,970	4,040	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	370	750	800
2	Divided	*	730	1,630	1,700
3	Divided	*	1,170	2,520	2,560
4	Divided	*	1,610	3,390	3,420

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
1	Divided	Yes	No	+5%
1	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding directional volumes in this table by 1.2

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	150	390	1,000
50-84%	110	340	1,000	>1,000
85-100%	470	1,000	>1,000	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	140	480
50-84%	*	80	440	800
85-100%	200	540	880	>1,000

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Core Urbanized

Lanes	B	C	D	E
2	2,230	3,100	3,740	4,080
3	3,280	4,570	5,620	6,130
4	4,310	6,030	7,490	8,170
5	5,390	7,430	9,370	10,220
6	6,380	8,990	11,510	12,760

Urbanized

Lanes	B	C	D	E
2	2,270	3,100	3,890	4,230
3	3,410	4,650	5,780	6,340
4	4,550	6,200	7,680	8,460
5	5,690	7,760	9,520	10,570

Freeway Adjustments

Auxiliary Lane	Ramp Metering
+ 1,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	580	890	1,200	1,610
2	Divided	1,800	2,600	3,280	3,730
3	Divided	2,700	3,900	4,920	5,600

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
1	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 7
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities				Interrupted Flow Facilities					
					State Arterials				Class I	
	Freeways	Core Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	urban	urban								
Number of through lanes (both dir.)	4-10	4-12	2	4-6	2	4-8	2	4-8	4	4
Posted speed (mph)	70	65	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	70	55	55	50	55	35	35	50	50
Auxiliary Lanes (n,y)	n	n								
Median (d, twlt, n, nr, r)				d	n	r	n	r	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone			80							
Exclusive left turn lane impact (n, y)			[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)					n	n	n	n	n	n
Facility length (mi)	3	3	5	5	2	2	1.9	1.8	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.090	0.085	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.550	0.560	0.565	0.560	0.565	0.565
Peak hour factor (PHF)	0.95	0.95	0.95	0.95	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	4.0	4.0	2.0	2.0	1.0	1.0	1.0	1.0	2.5	2.0
Speed Adjustment Factor (SAF)	0.975	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968	0.968		0.968						
% left turns					12	12	12	12	12	12
% right turns					12	12	12	12	12	12
CONTROL CHARACTERISTICS										
Number of signals					4	4	10	10	4	6
Arrival type (1-6)					3	3	4	4	4	4
Signal type (a, c, p)					c	c	c	c	c	c
Cycle length (C)					120	150	120	120	120	120
Effective green ratio (g/C)					0.44	0.45	0.44	0.44	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)									n, 50%, y	n
Outside lane width (n, t, w)									t	t
Pavement condition (d, t, u)									t	
On-street parking (n, y)										
Sidewalk (n, y)										n, 50%, y
Sidewalk/roadway separation(a, t, w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
		Two-Lane	Multilane	Class I	Class II			
	Density	%ffs	Density	ats	ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

TABLE 8

Generalized **Peak Hour Directional** Volumes for Florida's Transitioning Areas **and** Areas Over 5,000 Not In Urbanized Areas[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Class I (40 mph or higher posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	710	800	**
2	Divided	*	1,740	1,820	**
3	Divided	*	2,670	2,740	**

Class II (35 mph or slower posted speed limit)

Lanes	Median	B	C	D	E
1	Undivided	*	330	680	720
2	Divided	*	500	1,460	1,600
3	Divided	*	810	2,280	2,420

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
1	Divided	Yes	No	+5%
1	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding directional volumes in this table by 1.2

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	140	320	1,000
50-84%	100	280	940	>1,000
85-100%	380	1,000	>1,000	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	140	480
50-84%	*	80	440	800
85-100%	200	540	880	>1,000

BUS MODE (Scheduled Fixed Route)[3]

(Buses in peak hour in peak direction)

Sidewalk Coverage	B	C	D	E
0-84%	> 5	≥ 4	≥ 3	≥ 2
85-100%	> 4	≥ 3	≥ 2	≥ 1

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
2	2,430	3,180	3,790	3,910
3	3,520	4,670	5,610	5,870
4	4,630	6,170	7,440	7,830
5	5,480	7,310	8,730	9,800

Freeway Adjustments

Auxiliary Lane	Ramp Metering
+ 1,000	+ 5%

UNINTERRUPTED FLOW HIGHWAYS

Lanes	Median	B	C	D	E
1	Undivided	560	860	1,160	1,560
2	Divided	1,710	2,470	3,120	3,550
3	Divided	2,560	3,700	4,680	5,320

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
1	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

[3] Buses per hour shown are only for the peak hour in the single direction of the higher traffic flow.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 8
(continued)

Generalized **Peak Hour Directional** Volumes for Florida's Transitioning Areas **and** Areas Over 5,000 Not In Urbanized Areas

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities			Interrupted Flow Facilities					
				State Arterials				Class I	
	Freeways	Highways		Class I		Class II		Bicycle	Pedestrian
ROADWAY CHARACTERISTICS									
Area type (urban, rural)	urban								
Number of through lanes (both dir.)	4-10	2	4-6	2	4-6	2	4-6	4	4
Posted speed (mph)	70	50	50	45	50	30	30	45	45
Free flow speed (mph)	75	55	55	50	55	35	35	50	50
Auxiliary lanes (n,y)	n								
Median (d, n, nr, r)			d	n	y	n	y	r	r
Terrain (l,r)	l	l	l	l	l	l	l	l	l
% no passing zone		60							
Exclusive left turn lane impact (n, y)		[n]	y	y	y	y	y	y	y
Exclusive right turn lanes (n, y)				n	n	n	n	n	n
Facility length (mi)	6	5	5	1.8	2	2	2	2	2
TRAFFIC CHARACTERISTICS									
Planning analysis hour factor (K)	0.098	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
Directional distribution factor (D)	0.55	0.55	0.55	0.550	0.570	0.570	0.565	0.570	0.570
Peak hour factor (PHF)	0.92	0.92	0.92	1.000	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,950	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	9.0	4.0	4.0	2.0	3.0	2.0	3.0	3.0	3.0
Speed Adjustment Factor (SAF)	0.975		0.975						
Capacity Adjustment Factor (CAF)	0.968		0.968						
% left turns				12	12	12	12	12	12
% right turns				12	12	12	12	12	12
CONTROL CHARACTERISTICS									
Number of signals				5	4	10	10	4	6
Arrival type (1-6)				4	3	4	4	4	4
Signal type (a, c, p)				c	c	c	c	c	c
Cycle length (C)				120	150	120	150	120	120
Effective green ratio (g/C)				0.44	0.45	0.44	0.45	0.44	0.44
MULTIMODAL CHARACTERISTICS									
Paved shoulder/bicycle lane (n, y)								n, 50%, y	n
Outside lane width (n, t, w)								t	t
Pavement condition (d, t, u)								t	
On-street parking (n, y)								n	n
Sidewalk (n, y)									n, 50%, y
Sidewalk/roadway separation (a, t, w)									t
Sidewalk protective barrier (n, y)									n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways		Arterials		Bicycle	Ped	Bus
		Two-Lane	Multilane	Class I	Class II			
	Density	%ffs	Density	ats	ats	Score	Score	Buses/hr.
B	≤ 17	> 83.3	≤ 17	> 31 mph	> 22 mph	≤ 2.75	≤ 2.75	≤ 6
C	≤ 24	> 75.0	≤ 24	> 23 mph	> 17 mph	≤ 3.50	≤ 3.50	≤ 4
D	≤ 31	> 66.7	≤ 31	> 18 mph	> 13 mph	≤ 4.25	≤ 4.25	< 3
E	≤ 39	> 58.3	≤ 35	> 15 mph	> 10 mph	≤ 5.00	≤ 5.00	< 2

% ffs = Percent free flow speed ats = Average travel speed

TABLE 9

Generalized **Peak Hour Directional** Volumes for Florida's Rural Undeveloped Areas **and** Developed Areas Less Than 5,000 Population[1]

January 2020

INTERRUPTED FLOW FACILITIES

STATE SIGNALIZED ARTERIALS

Lanes	Median	B	C	D	E
1	Undivided	*	670	740	**
2	Divided	*	1,530	1,580	**
3	Divided	*	2,360	2,400	**

Non-State Signalized Roadway Adjustments

(Alter corresponding state volumes by the indicated percent.)

Non-State Signalized Roadways - 10%

Median & Turn Lane Adjustments

Lanes	Median	Exclusive Left Lanes	Exclusive Right Lanes	Adjustment Factors
1	Divided	Yes	No	+5%
1	Undivided	No	No	-20%
Multi	Undivided	Yes	No	-5%
Multi	Undivided	No	No	-25%
–	–	–	Yes	+ 5%

One-Way Facility Adjustment

Multiply the corresponding directional volumes in this table by 1.2

BICYCLE MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Rural Undeveloped

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	70	110	170
50-84%	60	120	180	580
85-100%	140	210	1,000	>1,000

Developed Areas

Paved Shoulder/Bicycle Lane Coverage	B	C	D	E
0-49%	*	120	260	840
50-84%	100	240	720	1,000
85-100%	320	1,000	>1,000	**

PEDESTRIAN MODE[2]

(Multiply vehicle volumes shown below by number of directional roadway lanes to determine two-way maximum service volumes.)

Sidewalk Coverage	B	C	D	E
0-49%	*	*	120	460
50-84%	*	80	430	770
85-100%	180	520	860	>1,000

UNINTERRUPTED FLOW FACILITIES

FREEWAYS

Lanes	B	C	D	E
2	2,010	2,770	3,270	3,650
3	2,820	3,990	4,770	5,470
4	3,630	5,220	6,260	7,300

Freeway Adjustments

Auxiliary Lane
+ 1,000

UNINTERRUPTED FLOW HIGHWAYS

Rural Undeveloped

Lanes	Median	B	C	D	E
1	Undivided	240	450	730	1,490
2	Divided	1,630	2,350	2,910	3,280
3	Divided	2,450	3,530	4,360	4,920

Developed Areas

Lanes	Median	B	C	D	E
1	Undivided	540	820	1,110	1,490
2	Divided	1,530	2,210	2,820	3,220
3	Divided	2,300	3,320	4,240	4,830

Passing Lane Adjustments

Alter LOS B-D volumes in proportion to the passing lane length to the highway segment length

Uninterrupted Flow Highway Adjustments

Lanes	Median	Exclusive left lanes	Adjustment factors
1	Divided	Yes	+5%
Multi	Undivided	Yes	-5%
Multi	Undivided	No	-25%

[1]Values shown are presented as peak hour directional volumes for levels of service and are for the automobile/truck modes unless specifically stated. This table does not constitute a standard and should be used only for general planning applications. The computer models from which this table is derived should be used for more specific planning applications. The table and deriving computer models should not be used for corridor or intersection design, where more refined techniques exist. Calculations are based on planning applications of the HCM and the Transit Capacity and Quality of Service Manual.

[2] Level of service for the bicycle and pedestrian modes in this table is based on number of vehicles, not number of bicyclists or pedestrians using the facility.

* Cannot be achieved using table input value defaults.

** Not applicable for that level of service letter grade. For the automobile mode, volumes greater than level of service D become F because intersection capacities have been reached. For the bicycle mode, the level of service letter grade (including F) is not achievable because there is no maximum vehicle volume threshold using table input value defaults.

Source:
Florida Department of Transportation
Systems Implementation Office
https://www.fdot.gov/planning/systems/

TABLE 9 (continued)

Generalized **Peak Hour Directional** Volumes for Florida's Rural Undeveloped Areas **and** Developed Areas Less Than 5,000 Population

January 2020

INPUT VALUE ASSUMPTIONS	Uninterrupted Flow Facilities					Interrupted Flow Facilities				
	Freeways	Highways Undeveloped		Highways Developed		Arterials		Bicycle		Pedestrian
ROADWAY CHARACTERISTICS										
Area type (urban, rural)	rural									
Number of through lanes (both dir.)	4-8	2	4-6	2	4-6	2	4-6	4	4	2
Posted speed (mph)	70	55	55	50	50	45	45	55	45	45
Free flow speed (mph)	75	60	60	55	55	50	50	60	50	50
Auxiliary lanes (n,y)	n									
Median (d, n, nr, r)			d		d	n	r	r	r	n
Terrain (l,r)	l	l	l	l	l	l	l	l	l	l
% no passing zone		20		60						
Exclusive left turn lanes (n, y)		[n]	y	[n]	y	y	y	y	y	y
Exclusive right turn lanes (n, y)						n	n	n	n	n
Facility length (mi)	18	10	10	5	5	1.9	2.2	4	2	2
TRAFFIC CHARACTERISTICS										
Planning analysis hour factor (K)	0.105	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095	0.095
Directional distribution factor (D)	0.55	0.55	0.55	0.55	0.55	0.550	0.550	0.570	0.570	0.550
Peak hour factor (PHF)	0.88	0.88	0.88	0.88	0.88	1.000	1.000	1.000	1.000	1.000
Base saturation flow rate (pcphpl)	2,400	1,700	2,200	1,700	2,200	1,950	1,950	1,950	1,950	1,950
Heavy vehicle percent	12.0	5.0	12.0	5.0	8.0	3.0	3.0	6.0	3.5	3.0
Speed Adjustment Factor (SAF)	0.975		0.975		0.975					
Capacity Adjustment Factor (CAF)	0.968		0.968		0.968					
% left turns						12	12		12	12
% right turns						12	12		12	12
CONTROL CHARACTERISTICS										
Number of signals						5	6	2	4	4
Arrival type (1-6)						3	3	3	3	3
Signal type (a, c, p)						c	c	a	a	a
Cycle length (C)						90	90	60	90	90
Effective green ratio (g/C)						0.44	0.44	0.37	0.44	0.44
MULTIMODAL CHARACTERISTICS										
Paved shoulder/bicycle lane (n, y)								n,50%,y	n,50%,y	n
Outside lane width (n, t, w)								t	t	t
Pavement condition (d, t, u)								t	t	
Sidewalk (n, y)										n,50%,y
Sidewalk/roadway separation(a, t,w)										t
Sidewalk protective barrier (n, y)										n

LEVEL OF SERVICE THRESHOLDS

Level of Service	Freeways	Highways				
		Two-Lane ru		Two-Lane rd	Multilane ru	Multilane rd
	Density	%tsf	ats	%ffs	Density	Density
B	≤ 14	≤ 50	≤ 55	> 83.3	≤ 14	≤ 14
C	≤ 22	≤ 65	≤ 50	> 75.0	≤ 22	≤ 22
D	≤ 29	≤ 80	≤ 45	> 66.7	≤ 29	≤ 29
E	≤ 36	> 80	≤ 40	> 58.3	≤ 34	≤ 34

Level of Service	Arterials	Bicycle	Pedestrian
	Major City/Co.(ats)	Score	Score
B	> 31 mph	≤ 2.75	≤ 2.75
C	> 23 mph	≤ 3.50	≤ 3.50
D	> 18 mph	≤ 4.25	≤ 4.25
E	> 15 mph	≤ 5.00	≤ 5.00

%tsf = Percent time spent following %ffs = Percent of free flow speed ats = Average travel speed ru = Rural undeveloped rd = Rural developed